187

The Boston Medical and Surgical Journal

TABLE OF CONTENTS

May 17, 1917

ORIGINAL ARTICLES

RECENT INVESTIGATIONS ON THE BACTERIOLOGY OF ACUTE POLIOMYELITIS. *By Ludvig Hektoen*, Chicago 687

MOUTH INFECTIONS IN THEIR RELATION TO SYSTEMIC DISEASE. *By Paul A. Hudnut, M.D.*, Northampton, Mass. 695

THE INCIDENCE OF INTESTINAL ADHESIONS AS A FACTOR IN CHRONIC INTESTINAL STASIS IN THE EPILEPSIES. *By H. Caro, M.D.*, Palmer, Mass. 697

RESPIRATORY SUCTION AN AID IN SURGICAL SHOCK. *By W. T. Porter, M.D.*, Boston 699

MEDICAL PROGRESS

PROGRESS IN GYNECOLOGY. *By Stephen Rushmore, M.D.*, Boston. 700

REPORTS OF SOCIETIES

NEW ENGLAND PEDIATRIC SOCIETY, MEETING OF DEC. 29, 1916. 707

BOOK REVIEW

The Proceedings of the Charaka Club 710

EDITORIALS

RATIONAL ECONOMY OF DIET 711

PHYSIQUE AND THE MILITARY AGE 712

HARVARD BASE HOSPITAL UNIT 712

POSTPONEMENT OF INDUSTRIAL HEALTH INSURANCE 713

MEDICAL NOTES 714

MASSACHUSETTS MEDICAL SOCIETY

NOTES FROM THE DISTRICT MEDICAL SOCIETIES 719

MISCELLANY

NOTICES, APPOINTMENTS, RECENT DEATHS, ETC. 720

Original Articles.

RECENT INVESTIGATIONS ON THE BACTERIOLOGY OF ACUTE POLIOMYELITIS.*

BY LUDVIG HEKTOEN, CHICAGO.

MY purpose is to bring before you the results of certain recent investigations into the bacteriology of acute epidemic poliomyelitis. The early bacteriological examinations in poliomyelitis yielded inconstant and inconsistent results that need not be reviewed in detail, but it is not unlikely that Geirsvold, for instance, as well as others, had in hand the organisms now to be considered. Since the discovery that poliomyelitis is transmissible to monkeys and that the causative agent passes through certain filters, the investigations into the etiology and transmission of the disease have been conducted practically exclusively from the viewpoint that the cause is a filterable, ultramicroscopic or nearly ultramicroscopic agent, and owing very largely to the comprehensive work of Flexner and his associates this view as to the cause of poliomyelitis is now accepted generally. In the meantime bacteriological examination by the usual and ordinary methods of the nervous system and other tissues of poliomyelitis patients apparently was suspended, presumptively because such methods no longer were believed capable of yielding results of any real value. Accordingly, the announcements last fall from several sources that certain coccal bacteria with interesting properties had been obtained from the brain and cord of a not inconsiderable number of cases of acute poliomyelitis by direct cultural methods, were rather unexpected. I believe that no matter what the final conclusion as to the significance of these observations may be, they are of such nature as to call for careful consideration.

THE METHODS OF ISOLATION.

In the closer consideration of the newly studied organism from cases of poliomyelitis I shall follow the results reported by Dr. George Mathers[1] of the Memorial Institute for Infectious Diseases, with whose work I am directly familiar, being careful, however, to note important deviations and additions in the reports of others.

Mathers made his primary cultures from the brain and spinal cord and other materials from typical cases of acute poliomyelitis, obtained as soon after death and by as sterile methods as possible. Small pieces of nervous tissue were washed in sterile salt solution, and after being thoroughly crushed with sterile forceps, held within the culture tubes, dropped into the medium. In this way inoculations were made in ascites fluid media containing pieces of fresh sterile rabbit kidney, and ascites dextrose broth. The tubes were incubated under aerobic and anaerobic conditions, the latter being obtained by means of a layer of paraffin oil on top of the medium. It is perhaps well to state that special, even elaborate, control tests have been made in each case to determine that the media and the rabbit tissue used were sterile to begin with. Usually growth would appear in some of the tubes in 1-5 days; in a series of 10 consecutive cases, cultures of the coccus in question were secured from the nervous system in 9, 7 times in pure form, twice with staphylococci, once with B. subtilis also; it was grown from the mesenteric lymph nodes and the kidneys in one of two cases in which those structures were examined.

---

* This paper is the substance of a Cutter lecture, Harvard Medical School, April 3, 1917.

Rosenow and his co-workers[2] state that by emulsifying in a sterile air chamber a rather large amount of brain and cord obtained under sterile precautions, and inoculating ascites-dextrose agar and ascites fluid containing sterile tissue with varying amounts of the emulsion, they succeeded in isolating a peculiar coccus from the brain and cord in each of 12 cases of poliomyelitis in New York City which came to necropsy, and also from the intervertebral ganglia and lymph nodes in some of the cases. And Nuzum and Herzog[3] in Chicago, using in part the same materials as Mathers, and similar methods, obtained pure cultures of what, from their description, may be the same coccus from the brain and cord of 9 cases, once with B. subtilis also.

We see, then, that in something like 20 or more fatal instances of poliomyelitis, about equally divided between Chicago and New York, studied at the same time, namely, in August and September, 1916, pure cultures of apparently the same organisms were obtained in very nearly 100%. It should be said that smears and sections of brains and cords from which cultures were obtained have been found to contain coccal forms quite like forms seen in the cultures; this is true of every case in Mathers' series. As shown in Fig. 1, similar bodies are demonstrable in older poliomyelitic material also.

Mention should be made of the results of cultures of materials from the throat and of cerebrospinal fluid in poliomyelitis. From the throat, the tonsils, and tonsillar abscesses of poliomyelitis patients, Rosenow, Towne and Wheeler isolated cocci with the same characteristics as those they obtained from the brain and cord. In their hands the cerebrospinal fluid drawn during life proved sterile, and this was Mathers' experience also, but in five cases examined after death he got pure culture in each case. Nuzum and Herzog, who report the isolation of the organisms from tonsils and mesenteric lymph nodes, as well as from the nervous system, obtained it too from the cerebrospinal fluid during life.

CULTURAL PECULIARITIES.

The different strains of micrococci obtained by Mathers in cultures of the brain and cord of 9 cases of poliomyelitis grow in the same way in various ascites fluid media and on blood agar. In ascites dextrose broth there develops, after 18 hours or longer, a diffuse turbidity, which becomes more or less granular, while a whitish sediment collects at the side and bottom of the tube; in the anaerobic tissue media the part around the tissue becomes opalescent in 24-48 hours or so, a fine sediment collects about the tissue, gradually a fine haze extends upward, and eventually the whole column becomes turbid, from 3-7 days being required for a good growth to develop.

Of these strains, all fermented dextrose, maltose, lactose; the majority mannite, raffinose and salicin; and one-half inulin. Two strains liquefied gelatin and decolorized litmus milk.

On blood agar (1 part of human blood to 9 parts of plain agar) the organism grows slowly, especially early after isolation. Initial cultures have not been obtained on this medium. The colonies are usually somewhat dry, small, and surrounded by faint halos of greenish discoloration. After two or three days the halo becomes a hazy ring of hemolysis.

As to the strains isolated by others, we as yet have brief preliminary statements only, which in some respects are contradictory, especially as to the fermentation, but correspond closely with respect to the manner of growth in ascites media and on blood agar.

MORPHOLOGIC CHARACTERISTICS.

In ascites dextrose broth the forms vary from large round or oval cocci and diplococci to minute barely visible forms. Chains occur with both large and small elements. In cultures a week or two old may be peculiar, irregularly-staining bodies. On blood agar we have a medium-sized coccus, slightly oblong, non-capsulated, arranged in pairs and short chains.

In the anaerobic media minute forms appear to predominate in pairs, chains, and groups, intermingled with large cocci, and in older cultures with peculiar bodies. Rosenow, Towne and Wheeler state that in a very few instances the early smears (from ascites fluid containing sterile tissue) showed the tiny globoid bodies described by Flexner and Noguchi in apparently pure culture, but usually there was also a certain number of medium-sized diplococci in short chains, which, so they say, Flexner and Noguchi and others considered as contaminations. The larger forms tend to grow smaller, so that frequently at the end of 12 or 14 days nothing but the tiny globoid bodies, single, in pairs, chains and clumps, could be found in the same tubes. After about three weeks the organisms became both larger and smaller; the small forms passed beyond the limit of visibility, and nothing but rather large oval cocci, staining a pinkish tint with the Giemsa stain, could be seen. They emphasize also a marked tendency of the microorganism to change to the form characteristic of the medium in which it is planted. Thus, an apparently pure culture of the very small globoid bodies in ascites tissue fluid when transferred to ascites-dextrose tissue broth would grow out rapidly, often in 24 hours, into the characteristic polymorphous coccus. Conversely, a transplant from broth to ascites fluid would grow slowly smaller.

With the possible exception of very minute forms, the organism is stained by Gram's method.

The tendency of the poliomyelitis coccus to vary in size and form is of much interest, but it should be remembered that cultures of staphylococci and streptococci also may assume large and small forms. When these bacteria are grown anaerobically in ascites media they may develop forms that closely resemble the bodies in Flexner and Noguchi's cultures of the minute organism from poliomyelitis; at the same time the tendency of the poliomyelitis coccus to assume small and peculiar forms is probably more marked than in the case of ordinary staphylococci and streptococci (Mathers).

FILTERABILITY.

Naturally the question arose whether the pleomorphic coccus from poliomyelitis would pass through filters commonly regarded as bacteria-tight. All the reports at hand state that in cultures the organism is filterable, the filters used being the Berkefeld N (in one case Berkefeld V). Rosenow, Towne and Wheeler state that "cultures showing the small forms have been filtered, and cultures of the filtrate have grown, but no growth has been obtained from filtrates of the same strains showing only large forms." Mathers finds that cultures pass Berkefeld N filters, especially ascites fluid tissue cultures, but not the Maassen (porcelain) filters. He also obtained typical, pure growths of the organism in cultures of Berkefeld N filtrates of suspensions of brain tissue in sterile salt solution in 3 cases; in 4 others the cultures were sterile. Rosenow and his associates found cultures of Berkefeld N filtrates of the brain and cord of rabbits dead with paralysis after intravenous injections of the large form of the organism to grow as very small bodies in ascites fluid, with or without sterile tissue, and as a polymorphous coccus in ascites dextrose broth.

Experiments with porcelain filters of the Chamberland type, through which the active agent of poliomyelitis is said to pass with little difficulty, do not seem to have been made.

THE EFFECTS IN ANIMALS.

At the present time the effects of the newly-discovered organism in poliomyelitis on animals may be discussed with profit as studied in the rabbit and monkey only. Rosenow, Towne and Wheeler report that injections of the organism in mixed and pure form cause paralysis with lesions of the nervous system in guinea-pigs, dogs and cats also, and Nuzum and Herzog claim that lambs are similarly affected—all animals heretofore regarded as insusceptible—but as yet no detailed description of the symptoms and lesions has been published. As regards the rabbit, all the observers appear to have obtained practically the same results: In young animals intravenous, intraperitoneal or intracerebral injection of pure cultures of the organism, after an incubation period, usually of 3-7 days, but occasionally longer, frequently cause a flaccid paralysis of one or more legs, as a rule followed by death 2 or 3 days later, sometimes in convulsions and sometimes with rapid respiratory embarrassment. Of 109 rabbits, 6 to 12 weeks old, injected intravenously or intracerebrally by Dr. Mathers with cultures, brain emulsion or filtrate of brain emulsion, 58 developed paralysis, the proportion being about the same in the various groups according as the mode of injection and substance injected; 15 died in convulsions or after the development of marked weakness, but without any indication of paralysis; the rest died very soon after the injection or remained entirely well. Arthritis developed in 2, iritis in 1, and endocarditis in 1. The organism was recovered in pure form, except for an occasional contamination, from the brain in 77 instances, the cord in 69, the cerebrospinal fluid in 53, from brain, cord or cerebrospinal fluid in 87, from the heart blood in 23, and from joints in 3, cultures from the materials indicated being made with equal care in every instance.

The organism appears then to settle chiefly in the nervous tissues where definite lesions are produced, in which it is demonstrable microscopically and from which it is recovered easily in pure form. The principal changes are hyperemia, edema and minute hemorrhages, especially in the gray matter, which in the spinal cord may stand out as a pink cross; the cerebrospinal fluid may be turbid and under pressure, the brain and cord soft and swollen; the microscopic changes are given as congestion and minute hemorrhages and more or less round cell infiltration in the gray matter, degeneration of the motor ganglion cells with satellitosis and neurophagocytosis. Nuzum and Herzog state that the changes in inoculated rabbits differ from those of poliomyelitis in man in that no perivascular infiltration is present and that the infiltrating cells are probably not lymphocytes. To these and other questions concerning the lesions in rabbits we shall return shortly. I would say here that these effects in rabbits have been obtained with cultures that have passed through 14 culture generations on blood agar.

Only few experiments have been made on monkeys. Mathers injected two rhesus monkeys, one intraperitoneally and one intravenously with the bacteria in 15 c. c. of a 24 hour ascites-dextrose-broth culture made directly from the brain of a poliomyelitis patient, but paralysis did not develop. He also injected 2 monkeys intracerebrally, one with the bacteria in 0. 5. c. c. and the other with those in 1 c. c. of the same culture; the latter animal developed a flaccid paralysis of the left arm in 4 days and was allowed to live, regaining partial use of the arm. Rosenow, Towne and Wheeler produced "characteristic paralysis and lesions in monkeys" by injections of a strain which, after isolation from a poliomyelitis brain, had passed through a series of three rabbits. And Nuzum and Herzog successfully inoculated a monkey with a mixture of five strains, but they do not state how long these strains had been cultivated. Obviously the possibility that the material injected in these experiments may have contained a distinct poliomyelitis agent in addition to the bacteria cannot be excluded; in the experiment of Rosenow, Towne and Wheeler, such agent may have been carried along through the series of rabbits, as there appears to be little question that the agent of poliomyelitis may survive in rabbits.

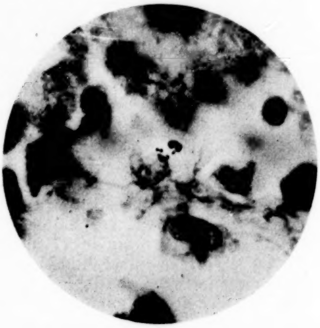

FIG. 1.

RESISTANCE TO GLYCEROL.

All observers state that the organism survives in poliomyelitis nervous tissue preserved in sterile 50% glycerol. From brain tissue treated in this way Mathers has obtained pure cultures at each of five successive monthly examinations, the organism retaining its power to cause paralysis in rabbits; smears of the brain tissue at the last examinations (March 12, 1917) rather indicated an increase in the number of cocci (Fig. 2).

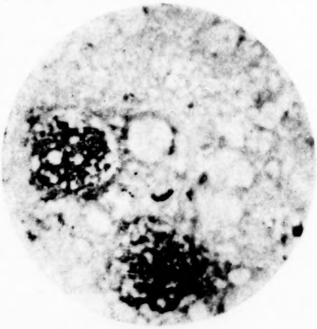

FIG. 2.

REACTIONS OF IMMUNITY.

As yet we have learned but little concerning the immunity reactions of the organism we are discussing. It is not agglutinated by antiserum for groups 1 and 2 of the pneumococcus (Mathers). In the serum of 7 patients, studied between the 6th and the 21st day of the attack of acute poliomyelitis, Mathers and Tunnicliff[4] found a definite increase in opsonin for the organism, lasting for 1 to 10 days. As no change was observed in the opsonin for ordinary streptococci in the serum of these patients, the thought arises that the opsonic reaction may be of differential value. The serum of rabbits injected with poliomyelitis cocci by Dr.

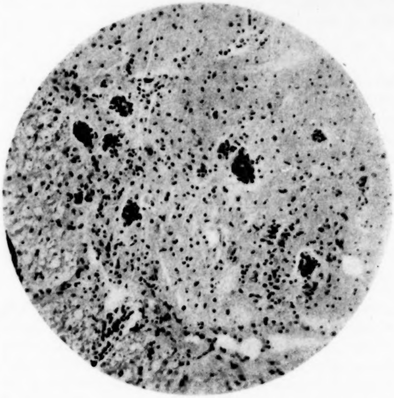

FIG. 3.

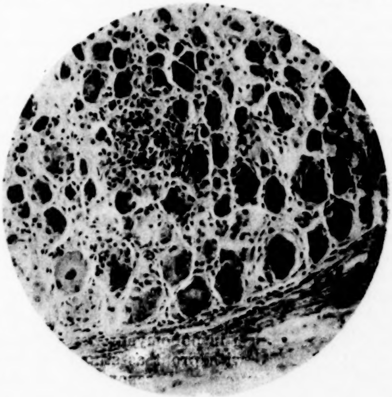

FIG. 4.

Katharine Howell (unpublished observations) has been found to contain much specific opsonim, acting on these cocci in a dilution of 1-7500, but having no stronger effect than normal serum on common streptococci and pneumococci. In such immune serum there is definite increase in the power to fix complement also, but whether of the strength and nature required for a test of differential significance we have yet to learn.

The protective and other effects of injections of the coccus have not received much attention as yet. Rosenow, Towne and Wheeler[5] record an experiment, the results of which they believe indicate that injections in the monkey of the coccus or of materials from animals injected therewith, all under conditions which would seem to exclude the anaerobic organism described by Flexner and Noguchi, may protect against poliomyelitic monkey virus (virulent emulsion of spinal cord or brain of monkey infected with poliomyelitis). New experiments with amplifications are needed to throw light on the relationships suggested by this result.

EXPERIMENTS WITH MONKEY PASSAGE-VIRUS.

Organisms, quite like those isolated from the brain and cord in human poliomyelitis have been obtained from glycerolated monkey virus. Rosenow and his co-workers state that they isolated such organisms from "brain and cord of paralyzed monkeys injected intracerebrally with fresh emulsions of brain and cord from human poliomyelitis (fresh human virus), with glycerolated human virus and monkey virus." While it is possible that the organism in these cases may have entered the brain and cord of the monkeys as secondary invaders during the course of the induced poliomyelitis, they very well may have been introduced with the virus because they have been found to occur in the brain and cord in the human disease, the primary source of all virus, and because they resist glycerol, and readily pass filters used to remove extraneous organisms from virus suspensions. Hence it does not seem strange that Mathers without any special difficulty isolated similar organisms from 4 of 7 samples of glycerolated monkey virus obtained elsewhere, 3 times in pure culture and once mixed with a staphylococcus, organisms which culturally, morphologically, and in their effects on rabbits, and in respect to filterability, in no way differ from those obtained from human poliomyelitis. The details are to be published by Dr. Mathers.

From the primary cultures in ascites dextrose broth inoculation of blood agar was made, and in the fourth generation on this medium, the transfer in each instance being made from a single colony, one of these strains caused a typical poliomyelitis in a young rhesus. The growth of 2 slants 24 hours after inoculation, was washed off in 1 c. c. of salt solution and injected intracerebrally; on the fifth day the monkey was weak, irritable and trembling; on the next day it had a flaccid paralysis of both lower extremities and of the right arm; it died with the typical gross and microscopic lesions of acute poliomyelitis. Inoculations with heart blood and joint fluid remained sterile, while the spinal fluid, the brain and cord gave pure growths of a coccus just like the one injected; cocci were found also in sections of the cord.

I would place special emphasis on the fact that in this experiment typical poliomyelitis was produced in a monkey by the injection of cocci obtained in ascites dextrose broth in pure culture from a glycerolated monkey virus, transferred to blood agar, and then retransferred 4 times from single colonies on this medium under aerbic conditions. The interpretations that suggest themselves to me of this interesting result are that the true cause of poliomyelitis was carried along in the cultures on blood agar or that the coccus caused the disease in the monkey, this disease being or not being true poliomyelitis. Further experiments are necessary, but that the disease in the monkey must be regarded as truly poliomyelitic is indicated by the result of the following experiment:

With the brain tissue of this monkey there was prepared with special care a Berkefeld filtrate, which seemed to be free from bacteria in the usual sense and which was injected into the brain of a young monkey (Monkey 2). On the 5th day there developed, after the usual premonitory symptoms, a limp paralysis of both arms and the left leg, followed by death. The lesions were typical of acute poliomyelitis (Fig. 3 and 4), cocci were present and cultures gave the same results as in the monkey which yielded the filtrate injected. As stated, at the time of injection this filtrate appeared to be bacteria-free, and all the aerobic cultures did remain sterile, but on the 11th day after they were made the anaerobic cultures began to show a faint growth around the tissue, consisting of very small gram-staining cocci in groups, pairs and chains with occasional large forms. Transferred to blood agar this coccal growth after 48 hours formed small, dry, green colonies and proved to be identical with the growth from the original brain tissue. We have here a good example of how difficult it may be to secure strictly bacteria-free filtrates of poliomyelitis tissue by means of the filters (Berkefeld) ordinarily used for that purpose. It would seem from this result that the freedom of Berkefeld filtrates from bacteria cannot be determined as readily as we are accustomed to believe.

POLIOMYELITIS IN THE RABBIT, WITH SPECIAL REFERENCE TO THE CHANGES CAUSED IN THE NERVOUS SYSTEM OF THIS ANIMAL BY THE COCCUS UNDER CONSIDERATION.

In view of the effects injections of the coccus from poliomyelitis produce in rabbits it becomes necessary to sketch rapidly the present state of the question of experimental poliomyelitis in this animal. The situation prior to the recent work by Rosenau and Havens[6] is well defined in the following statement by Flexner[7]: "At first it was strenuously denied that rabbits could be infected at all with the virus of poliomyelitis, and the examples of supposed successful inoculation reported were entirely disbelieved; but—and here he evidently refers to the work published by Marks[8]—it must now be accepted that young rabbits occasionally, but by no means generally, are subject to inoculation with the virus of poliomyelitis, at least after it has passed through a long series of monkeys. Apparently a small percentage only of the inoculated rabbits develop any obvious symptoms, and these die, as a rule, during convulsive seizures which come on suddenly. A given virus has up to the present been sent through a series of six rabbits, after which it has failed to be further propagated. From the sixth series it has been reimplanted on the monkey, in which animal typical paralysis has been produced. It remains to add that the rabbits which succumb to the inoculation do not show any characteristic alterations of the central nervous system or other organs, as far as has been determined. The monkey, on the other hand, invariably shows the typical lesion of the central nervous system."

We come now to the interesting work of Rosenau and Havens who carried a monkey virus progressively through 8 series of young rabbits. Apparently rabbits older than 6-8 weeks were insusceptible; success followed less than one-half the inoculations (intracranial, intravenous, into sheath of sciatic nerve, intranasal insufflation). Two chief groups of symptoms are described, developing usually after an incubation of 7-11 days; in the one, paralysis of one or more legs, with death, is the outstanding feature, and in the other a rather sudden weakness with extreme dyspnea, soon ending in death. Sometimes the two were combined. The gross lesions were injection of the pial vessels, hyperemia of the gray matter and more or less edema. Microscopically are described "capillary congestion, focal hemorrhages into the gray matter, degeneration of the large motor horn cells, and infiltration with cells of uncertain origin. These cells for the most part seem to be proliferated glia cells and therefore appear to be different from the infiltrating lymphocytes of the lesions of poliomyelitis in man. They are scattered throughout the grey matter, and are also grouped in satellite arrangement around the nerve cells, but the perivascular infiltration, so typical of the lesions of poliomyelitis in man and the monkey, is absent in the rabbit. A moderate degree of round-cell infiltration is occassionally seen in the meninges." Rosenau and Havens point out that while the lesions are not as distinctive as in man and monkey because perivascular infiltration is absent and the infiltrating cells possibly are not lymphocytes, it is more reasonable to believe that they are dealing with a virus which perhaps has undergone modifications of some kind than to assume that the disease induced in the rabbit is distinct from poliomyelitis. It seems to me that both the symptoms and the lesions noted in these experiments directly strengthen Flexner's conclusion that young rabbits occasionally are subject to inoculations with the virus of poliomyelitis.

The question that now presents itself is how do the lesions in the nervous system of rabbits injected with the coccus from poliomyelitis and from glycerolated monkey virus, compare with the lesions of the natural disease and of the induced form in monkey and rabbit? On account of the stress placed on the anatomical picture as a means of verification of the successful transmission of poliomyelitis to these animals, this question assumes a special interest. From my own study of materials at hand from rabbits inoculated by Dr. Mathers in various ways in the course of experiments with the coccus from poliomyelitis, I am impressed with the apparent variation in intensity and nature of the lesions not only in different animals treated in approximately the same way but in different parts of the nervous system of individual animals. The impression may be the result of the necessary limitation of our examination of single animals so far to relatively very small parts of the nervous system; and I think more extended examinations are needed for an adequate picture of the extent and nature of the lesions. At first glance congestion, edema, minute hemorrhages, and a moderate diffuse increase in the number of

Fig. 5.

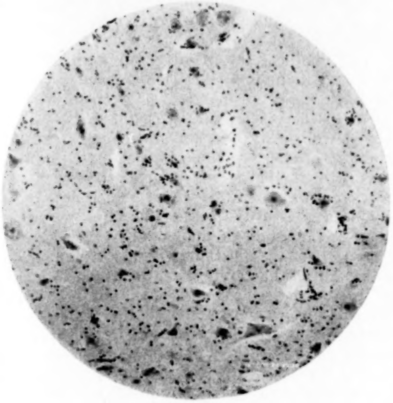

FIG. 6.

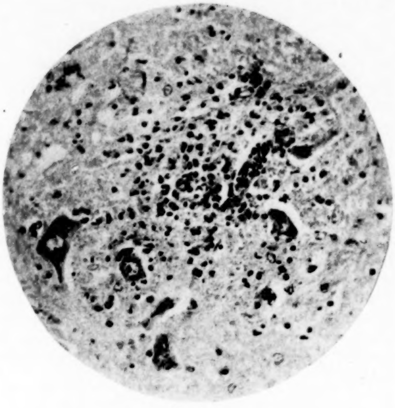

FIG. 8.

round cells in the gray matter, especially of the cord, with evident degeneration of motor cells and the gathering of at the most a few small cells at their margins, appear to be the prevailing features of the lesion. But focal accumulations of cells in the anterior horns and in the gray matter of the brain stem, usually about some small artery; infiltration, essentially lymphocytic, of the leptomeninx (Fig. 5), and of the choroid plexus (Fig. 7), and perivascular cellular accumulations (Fig. 9) quite as typical as those in human and monkey poliomyelitis, all occur and probably to a greater extent than so far observed. I have seen polynuclear infiltration of the pia with fibrinous exudation, but such changes seem quite exceptional. Neurophagocytosis, that is the invasion of the interior of ganglion cells by small cells that act as phagocytes, and which is so characteristic a feature in the passage-virus poliomyelitis of the monkey described by Flexner and others, has not been seen save in isolated instances in our rabbit material. Only very rarely are cells seen inside the neurocytes. The accumulation of 2-3 or more small cells at the margin of more or less altered ganglion cells, often lying in depressions on the surface, is however, common (Fig. 6). This is the so-called satellitosis; no doubt it frequently is called neurophagocytosis also. It may be noted here that Kling, Petterson and Wernstedt[9] describe a somewhat similar condition, which they call glia-cell-neuronophagia, in monkeys injected with filtered washings of the nose, throat, etc., of poliomyelitis patients, changes which they regard as degenerative rather than infiltrative owing, they believe, to a relative weakness of the virus.

I cannot go further into these matters now. I would emphasize, however, that the changes

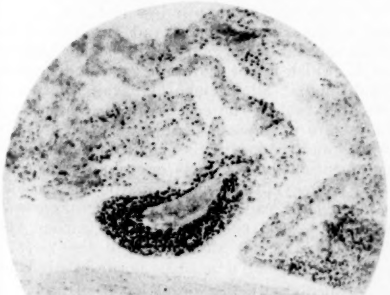

FIG. 7.

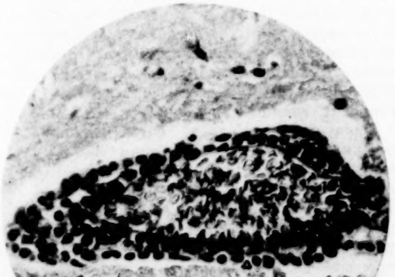

FIG. 9.

in the nervous system in rabbits inoculated with the coccus from poliomyelitis approach the changes of human and monkey poliomyelitis just as closely as those described by Rosenau and Havens in rabbits injected with passage-virus, and even closer because they reveal perivascular infiltration, a feature in the nervous lesion of poliomyelitis on which much stress is placed. It should be stated too that in our rabbits we have found local necrotic lesions in the liver and changes in lymph nodes similar to those described by some in poliomyelitis. However, in the absence of the crucial confirmation test of the production of typical poliomyelitis in monkeys with more refined materials than used so far from rabbits in which these lesions have been produced by injection of the coccus, we probably better not conclude now that the lesions described are pathognostic of poliomyelitis in the rabbit.

SIGNIFICANCE OF MICROCOCCUS—RECAPITULATION.

Heretofore the bacteria obtained from poliomyelitis have been regarded as contaminations of cultures or as secondary invaders. In the present case it seems to me that the first possibility may be dismissed from consideration without further notice as the circumstances surrounding the isolation of the coccus in hand are of such nature that it never can be read out of court as a contamination. As to the alternative possibility indicated it is safe to say that were it not for the remarkable effects of the coccus on the nervous system of monkeys and rabbits, its filterability, and its resistance to glycerol, it promptly would have been classed as a typical secondary invader and probably given only scant further notice. But by reason of these noteworthy properties this coccus demands a more considerate treatment. We might assume that the coccus is a secondary invader which may carry the actual cause of poliomyelitis with it from culture to culture or from culture to animal and back; or we might make so bold as to assume that the coccus is itself the cause of poliomyelitis. In either case we quickly encounter difficulties to be pointed out that we at present are unable to meet satisfactorily. Further and crucial experiments are necessary.

The question arises, why has not this coccus been seen and found before? One would thing that a coccus as readily demonstrable as this would have been encountered, if present, in the extremely thorough and competent search in recent years of what seems highly favorable material from spontaneous as well as experimental poliomyelitis. Are there perhaps different diseases included under the name of epidemic poliomyelitis? As there is ground for question as to the constancy of this coccus in poliomyelitis we need a larger body of new observations on that point. Observation and experiment, not argument, will solve the problems raised.

I hope the account of the facts I have tried to give is sufficient to justify the recapitulation I now shall present.

The micrococcus recently found in poliomyelitis and in poliomyelitis monkey virus appears to have many properties in common with the virus of the disease and with the minute organism described by Flexner and Noguchi: Under the conditions in which this minute organism was grown, the coccus appears to grow much in the same way and to assume very minute forms; the coccus readily passes the filters commonly used in the study of poliomyelitis virus, but the very important question, whether it will pass the finest filters that are said to let the active agent in the virus go through, has not been determined; like the virus the coccus under certain conditions is strongly resistant to the prolonged action of glycerol; in monkeys injections of the coccus 3 to 4 culture generations removed from the primary culture have produced conditions absolutely indistinguishable, clinically and anatomically, from the classical induced poliomyelitis in this animal, but the possibility that what may prove to be the true agent of poliomyelitis may be carried along with the coccus under such conditions must be considered; in young rabbits the coccus causes a flaccid paralysis and also other nervous symptoms as well as lesions that correspond almost completely to lesions regarded as distinctive of poliomyelitis, but the crucial confirmation test of production of poliomyelitis in monkeys by inoculation of cultures or other materials from such rabbits is still largely lacking; like the active agent in poliomyelitis virus the coccus too is strongly neurotrophic, and in the human disease as well as in the inoculated rabbit and monkey it locates with what seems a special preference in the central nervous tissues, in microscopic preparations of which it is demonstrable without great difficulty and from which it can be obtained in culture.

In various aerobic cultures, *e. g.*, blood agar, the coccus grows more or less like a streptococcus of the viridans type, and herein it differs from the minute organism of Flexner and Noguchi, which is not known to grow under aerobic conditions at all. I mention again that in inoculated rabbits the coccus in what seems now to be rare instances is associated with arthritis, iritis, and endocarditis, conditions heretofore not mentioned in reports on rabbits inoculated with poliomyelitis virus. Finally, the coccus is said to have caused paralysis and nervous lesions in several species which the earlier work indicated are not susceptible to the virus of poliomyelitis, but it must be borne in mind that experiments with the coccus have not proceeded far enough to make such statements in any sense final.

The study by immunologic methods, of the relationship of the coccus to the active agent in poliomyelitis virus, has not proceeded far enough to yield any definite results. That the coccus may take part in the reactions of the body during the acute stages of poliomyelitis is indicated by the increase in specific opsonin to which I have referred. I think it is of much interest that the coccus appears to be specific in its immunity reactions. Perhaps it may prove possible by such reactions, in conjunction with certain further tests, to learn to separate it easily from the other cocci with similar morphologic and cultural characteristics—in other words to work out a diagnostic method of practical value to the physician as well as the epidemiologist, in case future investigations shall show that the coccus is associated closely with poliomyelitis.

To conclude—the exact significance of this coccus in epidemic poliomyelitis cannot be determined now. The number of cases studied for its presence is too small to permit the conclusion that it occurs constantly in the disease or any form of the disease; in the few instances in which injections of cultures have resulted in a condition indistinguishable from what is accepted as poliomyelitis in the monkey, the possibility that another and more important microbe may have been present cannot be excluded; the true poliomyelitic nature of the very interesting lesion caused by the coccus in rabbits has not been confirmed by proper tests on monkeys; and we lack also the results of extended immunization experiments. In any event a most interesting coccus has been found that merits study for its own sake as well as on account of the close relation its brief history bears to poliomyelitis.

Note.—The recent articles by Flexner, Amoss, Bull (Jour. Exp. Med., 1917, Vol. xxv, p. 499 *et seq.*), Rosenow and Towne (Jour. Med. Research, 1917, Vol. xxxvi, p. 175), and by Blandon (*Ibid.*, p. 1) appeared too late to be considered at this time. They do not appear to me, however, to necessitate any material revisions in my presentation.

References.

[1] Mathers: Jour. A. M. A., 1916, 67, p. 1019; Jour. Infec. Dis., 1917, 20, p. 113.
[2] Rosenow, Towne and Wheeler: Jour. A. M. A., 1916, 67, p. 1202.
[3] Nuzum and Herzog: Jour. A. M. A., 1916, 67, p. 1205; Nuzum, *ibid.*, p. 1437.
[4] Mathers and Tunnicliff: Jour. A. M. A., 1916, 67, p. 1935.
[5] Rosenow, Towne and Wheeler: Jour. A. M. A., 1917, 68, p. 280.
[6] Rosenau and Havens: Jour. Exp. Med., 1916, 23, p. 461.
[7] Flexner: The Lancet, 1912, Nov. 9.
[8] Marks: Jour. Exp. Med., 1911, 14, p. 116.
[9] Kling, Wernstedt and Pettersson: Investigations on Epidemic Infantile Paralysis. The State Medical Institute, Stockholm, 1912, p. 211.

MOUTH INFECTIONS IN THEIR RELATION TO SYSTEMIC DISEASE.*

By Paul A. Hudnut, M.D., Northampton, Mass.

Dr. Woods Hutchinson has very aptly said: "A man is known by the teeth he keeps." This little aphorism, so true from every standpoint, I intend to make the keynote of my remarks.

There is no doubt that affections of the teeth and gums have recently come into great prominence, from the standpoint of etiology, and the practice of dentistry is beginning to take its proper place beside the other specialties. And certainly, viewed as to their bearing upon the general health, the teeth are quite as important as, for example, the tonsils. At any rate we know that large sums of money are now being spent in order to elevate the standard of dental practice. For example, the College of Physicians and Surgeons of New York has this year included in its regular medical curriculum a complete course in dental pathology. I understand, moreover, that the Rockefeller Foundation is endowing a dental hospital in connection with Columbia University, where it is the intention to educate what we may call super dentists; such men as are now found only in the larger cities: men who use an x-ray outfit in their offices as a matter of daily routine and with whom the physician is glad to consult. Also within the year, the Extension Teaching Department of the Rockefeller Foundation has helped to establish, in connection with Columbia University, a School for Dental Nurses, whose work will take them into the public schools, dental offices and the homes of patients, in "follow-up" visits.

In this connection it is of interest to hear that Columbia and Cornell have combined with the Roosevelt, Presbyterian and St. Luke's hospitals to found, in New York City, a twenty-million-dollar medical center, to be one of the largest and most complete in the world. Philadelphia promises to equal, if not surpass New York in a similar project. In the out-patient departments of city hospitals dental clinics now occupy a very important position, and a diagnosis is rarely made in any case until the patient has had his mouth examined by the dental surgeon and any doubtful teeth skiagraphed. All this points to the desirability of a closer coöperation between doctor and dentist outside the hospitals and large cities. The Springfield Academy of Medicine has invited dentists to become members, and already twelve have enrolled. This is a step in the right direction.

It is true that the old-school dentist is of little practical use to the physician. He almost never refers patients to the roentgenologist; he pulls out teeth that might and should be saved; he disregards the common rules of asepsis and has little or no knowledge of the treatment of Riggs' disease. On the other hand, as leading New York dentists tell me, only a small percentage of the physicians are capable of drawing correct conclusions from the conditions they find in the patient's mouth. The doctor's examination of the mouth should include:

(1) General hygiene. Some mouths are so filthy that, although there are no actual lesions present the patient suffers greatly from toxic absorption. (2) Set bridges and crowned teeth. (3) Carious teeth and broken off teeth. (4) Im-

---

* Read at the January meeting of the Hampshire County Medical Society.

pacted and partly erupted wisdom teeth. (5) Inflammation of the gums. This includes pyorrhea, inflammation of the gum margin around crowned teeth and over partly erupted wisdom teeth. Any one of these conditions may have an important bearing on the general health. If the physician finds or suspects trouble he should, if possible, take his patient to the dentist for a complete diagnosis and consultation, which may or may not have to be supplemented by a visit to the roentgenologist. In this way the patient is more apt to get the treatment he actually needs and may also be saved the expense of an unnecessary radiograph. Permanent bridges may harbor infection and are therefore dangerous. Crowned teeth are to be looked upon with suspicion. In this connection I will mention a case that occurred in the practice of a New York physician.

> The patient was a man of 45, in good health. During the month of August he went on a visit to the country and, after exercising violently in the afternoon, slept that night near an open window. In the morning his right arm was so painful that he could not dress without assistance. He was obliged to give up his work and at the end of six months, the arm was practically useless. All forms of treatment were tried,—including, of course, osteopathy, without results. His condition remained unchanged until he accidentally broke off the gold crown on his right, upper canine tooth. He immediately noticed a very foul odor and bad taste in his mouth. The following morning he was surprised to find that he could button his collar without help. He lost no time in having the abscessed root extracted and in ten days his arm was practically well.

Here, as frequently happens in this type of mouth infection, there were no focal symptoms and only a roentgenogram would have discovered "the nigger in the wood pile." It is surprising, also how promptly some obscure neuralgias and arthritides will clear up after the treatment of pyorrhea or the removal of an impacted wisdom tooth. Blind abscesses at the apices of devital teeth, without a "gum boil," are often impossible to detect without the aid of the roentgen ray, and this may show nothing but a slight rarefaction of the bone around the apex of the root. In other words these radiographs are at times very difficult to interpret.

H. S. Upson cites cases of insanity and epilepsy in which an impacted wisdom tooth proved to be the determining etiological factor. I will, in this connection, recall to your minds the case of Judge S———'s wife, forty years of age, who, after eighteen years of poor health and nervous debility, became mentally deranged. Her health, mental and physical, were restored after the extraction of an impacted wisdom tooth.

So much has been said and written of late about pyorrhea alveolaris, that the results of recent laboratory research are interesting. These experiments, carried out under the direction of Columbia University, seem to establish the following facts: The bacteriology of pyorrhea is a mixed one, and does not differ qualitatively from that of the healthy mouth. The organisms, while not causing the disease, doubtless complicate and give rise to some of its symptoms. The same may be said of the ameba. This being the case, treatment by vaccines is not to be recommended. Emetine, the much advertised amebacide, has no specific action in this disease; any slight improvement in the condition of the gums following its use, being due entirely to the hemostatic action of the drug. Failure to cure Riggs' disease by the proper mechanical treatment, which consists in the main of curettage, correction of faulty occlusion and attention to mouth hygiene, is due solely to lack of skill on the part of the operator. This, of course, applies to those cases in which the bone destruction is not sufficient seriously to loosen the teeth in their sockets. A well advanced case of pyorrhea with its discolored, loosened and denuded teeth, bathed in pus, is a disgusting sight. It has been estimated that in such cases three or four drams of pus, or more, are swallowed with the food each day. Rosenau has proved this condition of things to be the important factor in the causation of gastric ulcer; the streptococcal infection of the stomach mucosa being either direct or hematogenous. It is true that the gastric juice of a healthy individual is able to destroy these pyogenic organisms, as they are poured into the stomach, and will continue to do so for a variable length of time; but sooner or later, this power is exhausted and pathologic changes take place.

To these mouth infections, or to some other chronic focus of infection, as Billings points out, may be traced systemic diseases such as: arthritis, septic endocarditis, various septicemias, tuberculosis, nephritis, arteriosclerosis, pancreatitis, peptic and duodenal ulcers, furunculosis, keratitis, some cases of appendicitis, chorea, neurasthenia, general malaise and others. There is ample evidence to prove that removal of these foci of infection, wherever located within the body, is essential in the treatment of such diseases.

The effects of long-continued absorption from these chronic foci of infection are not always uniform. In some cases they seem to have no effect at all. In others cause and effect are unmistakable. In either case they unfavorably influence the prognosis and should be eliminated.

Modern dentistry is largely preventive and we are told that the permanent teeth need never become hopelessly decayed, provided that hygiene, diet and treatment are correct from the start.

In our rural schools one finds at least 95% of the children with decayed, neglected teeth; in fact the teeth receive no attention whatever until school age is reached and the visiting doctor discovers trouble. Even when the medical inspection of schools is faithfully carried out it still remains to persuade the parents to have the necessary work done and, in most cases, it takes a lot of persuading. On the other hand, children under state control, living in rural homes, are carefully supervised and receive all necessary medical and surgical attention, including treatment of teeth, tonsils and adenoids and eyes. One remedy for this bad state of things in the country would be another R. F. D., Rural Free Dentistry. The importance of mouth infections from an economic standpoint is beginning to be recognized by manufacturing companies all over the country. One large concern in this vicinity has offered to install dental clinics in the Northampton public schools and maintain them for a certain time, until the city is ready to assume control. This is an encouraging sign, but the work should really begin with the education of the pregnant woman.

The U. S. Department of Labor, in its pamphlet: "Prenatal Care," devotes a short paragraph to the care of the mother's teeth during pregnancy; but nothing is said regarding her diet as affecting the development of the infant's teeth in utero; the care of the baby's mouth and teeth before and during the first dentition; when to begin feeding starchy food (dental decay in children being chiefly due to the oral indigestion of carbohydrate foods); and the important fact that inflamed gums render the child more susceptible to infectious diseases.

I have tried to call attention to a few of the more common mouth infections, and their systemic effect, for the purpose of emphasizing the fact that no physical examination is complete which does not include the mouth; that in it, more often than in any other part of the body, are to be found chronic foci of infection, which may seriously prejudice the general health; that, when such foci are present, steps should at once be taken to eliminate them, as the only reasonable course to pursue; and to urge, in the interest of humanity, a closer coöperation between physician and dentist.

THE INCIDENCE OF INTESTINAL ADHESIONS AS A FACTOR IN CHRONIC INTESTINAL STASIS IN THE EPILEPSIES.*

By H. Caro, M.D., Palmer, Mass.

[From the Pathological Laboratory of the Monson State Hospital for Epileptics, Palmer, Mass.]

The trend of recent epileptologic research has been directed in large part toward the gastro-intestinal tract and the glands of internal secretion. It has been away from the brain structures and the postulates built about them, and once more toward the factors of intestinal irritation and intoxication. The presence of constipation among epileptics has been noted so frequently that again the tendency has been to account for the seizures as due to the absorption of toxic products from the chronic intestinal stasis that may be present.

The exact cause of the chronic intestinal stasis is still much in doubt. Up to the present time the investigations may be divided into two groups, namely, those which declare it due to faulty metabolism of the endocrine system, and those which account for the chronic intestinal stasis by the abnormalities of the intestinal tract that have been found to be present. Under the first group, the over-functionating of the adrenals has been presented as a causal factor. At least one type of epilepsy may be a disease process dependent upon the absorption of irritating substances from the intestinal tract, the inhibition of the smooth muscle fibers of the intestines being due to over-action of the adrenals, because of dysfunction of the pituitary gland or of the pancreas, or because of irritation of the duodenum. This conclusion is based upon animal experimentation and Abderhalden tests for adrenalin.[1] While this view has much in its favor, yet the fact that recent investigation has shown that the Abderhalden test as an index of disease, or of disorder of function of any particular gland, is not dependable, militates against its immediate acceptance.[2]

The second group of investigators believe that because of mechanical interference, the fecal current is obstructed, and chronic intestinal stasis with absorption of toxic products occurs.[3] This interference may be caused by some form of visceroptosis, by a large, flabby, mobile cecum, by retardative angulations at the hepatic or splenic flexures, by redundant sigmoid, by adhesions of both the ileum and the colon, or by exudative periduodenitis and the like. The nature of the toxic products has not been definitely discussed. It has been advocated that the product is a toxin formed by a bacillus,[4] but this hypothesis has not been confirmed.[5] These views depend for their substantiation upon Roentgen-ray examinations of the intestinal tract and upon findings at operation.

It was with this latter concept in mind that a review of necropsy records among institutional epileptics, for the purpose of ascertaining the relative frequency of such mechanical causes, was undertaken. But to correlate the presence of visceroptoses, angulations and the like, from necropsy reports is always open to the criticism that post-mortem changes may account for the lesions found. Accordingly, this investigation was limited merely to the presence of fibrous bands and adhesions, and their relation to the condition under discussion. While it may be said that these are the end results of constipation, or better, chronic intestinal stasis, yet it cannot be denied that their existence would prove that this condition in some degree was present.

---

* Read before the New England Society of Psychiatry, March 27, 1917.

A total of 250 post-mortem examinations was studied. In 212, no mention was made of chronic focal peritonitis, adhesions, or congenital abnormalities. For the purpose of this paper, these will be considered as essentially negative. Twenty-six cases among this number had cholelithiasis, accompanied in ten by chronic cholecystitis, but without evidence of local peritonitis. Of the twenty-six, only two died before the age of thirty, and over 80% occurred in those dying after the age of forty. In only one case was there a distinct etiologic factor present, namely, enteric fever. Hence the causal factor must be considered to be chronic intestinal stasis, which, by leading to an accumulation of feces in the hepatic flexure, interferes with the flow of bile through the cystic duct and thus produces stagnation in the gall-bladder and the tendency to form concretions. In passing, it may be of interest to note that the incidence of cholelithiasis in this series was 12.5%. This is somewhat higher than the incidence found in general hospitals (5% at St. George's Hospital, London; 9.4% by Naunyn; 6.9% by Mosher).[6]

Of the remaining thirty-eight cases, there were fifteen with chronic perityphilitis, varying from a single band to complete binding down of the appendix. Two of these cases were complicated by cholelithiasis. Chronic appendicitis is usually thought of as one of the factors to be considered in the causation of constipation. But Satterlee states that in a series of one hundred thirty-six cases suffering from chronic intestinal stasis, 25% had the appendix removed, but were not relieved by the procedure. There was a speedy relapse to the former condition.[7]

The following eight cases were examples of the results of pericolonic exudations, resulting from chronic intestinal stasis. Firm bands binding down the cecum were found in one case, not complicated by chronic appendicitis. Adhesions in the vicinity of the splenic flexure were found in five cases, three of these involving the spleen also. The descending colon and part of the transverse colon were found to be firmly bound down by fine adhesions in two cases.

Eight cases showed adhesions between the coils of the small intestine, probably the end-result of tubercular peritonitis. Their character could readily cause ileal stasis. Unfortunately, the data at my disposal was not sufficient to determine the relationship between the onset of the seizures and the abdominal condition.

There remain six cases where there were adhesions involving the gall-bladder, duodenum and transverse colon. Two were complicated by cholecystitis and cholelithiasis, and the adhesions present were probably the result of a local peritonitis following the gall-bladder infection. The remaining four cases were not complicated by gall-bladder disease, or by gastric or duodenal ulcer. In these, there were found fine, web-like adhesions extending from the gall-bladder to the hepatic flexure and involving the pylorus and first part of the duodenum. They may be classified as congenital transduodenal bands. Harris[8] believes that these bands are the remnants of the anterior mesentery of the upper gut. Persisting after the rotation of the stomach and duodenum has occurred during fetal life, they remain stretched across the duodenum and pylorus, extending from the inferior surface of the liver to the hepatic flexure. These bands may cause interference with the flow of the fecal current, resulting eventually in chronic intestinal stasis. They are precursors of—rather than the result of—the condition under discussion.

The last case of this series was one of umbilical hernia with adhesions to the small intestine. This lesion, however, definitely occurred many years after the onset of the epileptic seizures, and need not be considered further.

SUMMARY.

Intestinal adhesions and bands of varying degrees and etiology were described in thirty-eight cases in this series. These divide themselves into two groups: (a) those that may be considered to be a factor in the causation of chronic intestinal stasis, and (b) those that may be considered to be the result of this condition.

TABLE I.

Adhesions causing chronic intestinal stasis		12
Congenital transduodenal bands	4	
Inter-intestinal adhesions probably due to tubercular peritonitis	8	
Adhesions resulting from chronic intestinal stasis		25
Chronic perityphlitis	15	
Pericolonic exudations	8	
Due to gall-bladder disease	8	
Adhesions due to hernia		1
		38
Necropsies considered as negative		212
		250

In Group A, the four cases of transduodenal bands must be placed, for being congenital, they antedate the onset of the epileptic seizures, and from their position could easily be a strong factor in producing chronic intestinal stasis. If the conclusion that the eight cases of adhesions between the small intestines were the end-results of healed tubercular peritonitis is correct, then these may be considered under this heading, for from their very nature they would cause intestinal stasis of varying degrees.

The remaining twenty-five cases (the case of umbilical hernia being excluded) must be placed under Group B. The adhesions about the appendix may be the result of pericolonic exudations due to chronic intestinal stasis, as well as the result of a more acute process. Adhesions involving the remaining portions of the large intestine readily come under this heading.

In conclusion, it is evident that intestinal adhesions and bands play a rather small part in the causation of chronic intestinal stasis in the epilepsies. Excluding those lesions due to previous acute abdominal infection (*i.e.* tuberculosis), as well as those due to pericolonic exudations resulting from the stasis present, there are left but four cases (*i.e.* congenital transduodenal bands) in a series of two hundred fifty necropsies, where the clinical symptom may be said to be the result of the lesion found at autopsy.

REFERENCES.

[1] Cotton, Corson-White, Stevenson: "Pathogenesis and Treatment of Epilepsy." New York Med. Jour., Vol. civ, No. 12.
[2] Singer, H. D., and Quartz, W. B.: Archives of Int. Med., Vol. xviii, No. 4, p. 529.
[3] Reed, C. A. L.: "Diagnostic Methods and Pathologic Constants in Idiopathic Epilepsy." Jour. of A. M. A., Vol. lxvi, No. 5.
Powers, H.: "The Rôle of Gastric and Intestinal Stasis in Some Cases of Epilepsy." Boston Medical and Surgical Journal, Vol. clxxx, No. 6.
[4] Reed, C. A. L.: "The Bacillus Epilepticus." Jour. of A. M. A., Vol. lxvi, No. 21.
[5] Caro, H. and Thom, D. A.: "A Bacteriological Study of the Blood of Seventy Epileptics." Jour. of A. M. A., Vol. lxvii, p. 1088.
[6] Rolleston: "Diseases of the Liver." 1905. p. 703.
[7] Satterlee, G. R. "Chronic Intestinal Stasis." Am. Journal of Med. Sci., Vol. clii, No. 5 (No. 536), page 727.
[8] Harris, M. L.: "Constriction of the Duodenum Due to Abnormal Folds of the Anterior Mesogastrium." Jour. of A. M. A., Vol. lxii, p. 1211.

RESPIRATORY SUCTION AN AID IN SURGICAL SHOCK.

By W. T. Porter, M.D., Boston.

[From the Laboratory of Comparative Physiology in the Harvard Medical School.]

In dealing with surgical shock, it should always be borne in mind that life and death here depend on a relatively slight change in the arterial pressure. The diastolic pressure may fall from normal to the critical level with little or no danger—a further fall of even 10 millimeters is fatal, unless skilled assistance be at hand. Conversely, in dangerous shock, lifting the diastolic pressure 15 millimetres will save life, as a rule.

I have elsewhere insisted on the importance of the inclined position. In shock, the sufferer bleeds into his own abdominal veins. They take the blood from the heart and brain. The inclined position feeds the heart and brain by gravity. But gravity is slow and death draws swiftly on. How may the wounded wait and still be safe? Time may be gained by adrenalin and by injecting normal saline into the veins. Both tend to fill the heart; one by narrowing the arterial outlets, the other by adding to the volume of the blood. Neither is a logical remedy, for neither brings back the blood from the congested veins into the arteries and thus into the feeding capillaries. The veins store but do not feed. We should pump the blood from these fatal wells into the heart. Such is the logical ideal.

I propose a remedy which satisfies this ideal. I propose the thoracic pump.

When the diaphragm descends in inspiration, the cavity of the thorax is enlarged. It is as if a squeezed rubber bulb were expanded under water; the surrounding fluid enters the sucking ball. So do surrounding fluids enter the chest. The air is sucked in through the trachea and blood is sucked in through the veins. In man, this suction may balance a column of mercury 30 millimetres high, equal to a column of blood 15 inches high—a value one third the total normal diastolic arterial pressure. Without this respiratory suction, a weak arterially-toned man would faint every time he stood up. It is this potent force I propose as a life-saver in traumatic shock.

If the normal contractions of the diaphragm so aid the circulation, its powerful contraction will aid still more. Powerful and frequent contractions are within our command. We have but to increase the carbon dioxide in the inspired air to call forth deep and rapid respiration. The necessary amount of carbon dioxide is not injurious. To an animal it can be given from a gas tank discharging through a Wolff bottle into a T tube, the short limb of which is attached to the tracheal cannula. In man, rebreathing may be employed. The patient may breathe in and out of a rubber bathing cap, previously inflated with a Davidson syringe. When oxygen hunger approaches, the cap is removed. In a moment or two the experiment may be repeated.

In the course of the past two months, March and April, I have with carbon dioxide produced deep and rapid respiration in many animals in whom surgical shock had been brought on by injecting oil into the external jugular vein. The diastolic arterial pressure in these animals was often dangerously low. In every case, the diastolic pressure rose 15 to 30 millimetres of mercury. Such a rise, for example, from 50 to 70 millimetres, carries the pressure out of the danger zone.

The author has made as yet no observations on men with shock. He is now on his way to France to make these observations upon the wounded. There is every reason to believe that carbon dioxide respiration in men will cause at least as great a rise as in animals. In that case, we shall have an effective and easy method for the treatment of traumatic shock in man.

Association of American Physicians.—The annual meeting of the Association of American physicians was held at Atlantic City, N. J., on May 3, 4 and 5. At the opening session, Dr. Francis W. Williams of Boston was elected president for the ensuing year.

Medical Progress.

PROGRESS IN GYNECOLOGY.

BY STEPHEN RUSHMORE, M.D., BOSTON.

Chancre of the Cervix.

Wile[1] and Senear report two cases of chancre of the cervix uteri. Judging from the paucity of literature on this subject, the lesion is rare, although the reports of those who have made systematic examinations in cases of recent syphilitic infection show the primary sore in the cervix in as high as five per cent. It is doubtless more frequent than is generally thought, and for anatomical reasons is likely to remain hidden and unrecognized.

The lesion presents certain difficulties in diagnosis on account of its inaccessibility and on account of the structure of the cervix. It is indurated, painless, usually single; no functional disturbance is observed in the majority of cases. It occurs as a flat purplish erosion, somewhat sharply raised above the surrounding tissue, not infrequently covered by a pseudomembranous exudate. The purpuric or hemorrhagic border is usually demonstrable. According to the size there may be slight or considerable discharge.

Differential diagnosis includes the consideration of the following conditions: simple cervical erosions, chancroid, herpes simplex and carcinoma. Differentiation is usually easy except in carcinoma, where, on account of the friability of the tissue, diagnosis may be possible only under the microscope. In both of the cases reported, living spirochetes were demonstrated with the dark field in smears from the suspected lesion.

Operations on the Cervix.

The question of what harm may result from a torn cervix has not been answered as yet in such a manner that discussion has ceased. But if, as some writers claim, such lacerations result in disturbances of function and possibly give a point of lowered resistance for the development of cancer, they should be removed. Accepting this dictum, Boldt[2] describes a simple operation for repair, dentoting it as intermediate trachelorrhaphy. By this is meant an operation about six weeks after the injury, at a time intermediate between the fresh injury and the firm scar which ultimately forms. The patient is placed in the lithotomy position, and the usual disinfection employed. A general anesthetic may not be necessary. The cervix is exposed and drawn down. With a narrow sharp scalpel a "film of tissue is scraped off the torn surface, taking perticular care that the angles of the tear are made raw." Sutures of chromic catgut are then passed so as to include the entire depth of the tear. No after-treatment is necessary and the patient may be up and around as usual after the operation.

The operations for laceration of the cervix are generally thought to be simple and efficacious. The report by Leonard from Kelly's clinic showed results that "were quite unexpected and in many ways disappointing." This substantiated the views of Sturmdorf[3] who has sought to obtain better results.

First, as to the significance of cervical lacerations for the patient. They are important because they present portals of entry for infection which may manifest itself in disturbed function of the uterus, tubes and ovaries. The best time, then, to treat lacerations is when they are fresh, with which view agreement is not general. The interference with uterine function, apart from the more obvious gross infections, is interference with the characteristic contractile phenomena of the uterus, whereby at all times the normal circulatory balance of the uterus is regulated. The exposition of views as to the function of the cervix is interesting, but, as the author says, the function remains generally unrecognized. Perhaps this is due to the lack of supportive evidence.

But the practical problem is: if amputation seems advisable, to get the smallest possible wound surface, by bringing the edge of the vagina as close as possible to the edge of the cervical mucous membrane, after removing as much as possible of the diseased cervical mucous membrane. Sturmdorf makes a suggestion that is worth noting. First a circular amputation is performed with ample vaginal flap, removing a cone of cervical tissue nearly up to the internal os. The vaginal cuff is drawn into the depression in the cervix by sutures in the mid line anteriorly and posteriorly. The placing of these sutures is the important point. It may be best described without a diagram by using a silkworm gut suture with a needle on each end. The suture grasps the anterior flap of vaginal mucous membrane at the mid line, the needles passing from the epithelium to the raw surface. The needles then pass through the anterior wall of the cervix from within outward, entering just below the edge of the cervical mucous membrane, passing through cervix and vaginal mucous membrane and emerging at the base of the flap. Care must be taken with the anterior suture not to penetrate the bladder. This mattress suture draws the vaginal mucous membrane up into the new cervical canal and only a second suture posteriorly may be needed. These stitches represent a distinct contribution. The author leaves them in for two weeks when he says they can be easily removed.

Displacements of the Uterus.

It has been acknowledged that trauma may cause an acute retro-displacement of the uterus. But in any given case in which displacement is found after an accident, it may be difficult to prove that the displacement was the result of the injury. Barringer[4] reports a series of six cases in which the trauma seemed beyond reasonable doubt to have been responsible for the displacement. Often the symptoms are misleading and insidious and hence the condition is overlooked. The history shows that the violence was of a nature to have produced such a displacement,—falls on the back, falls in the sitting position, or sudden unexpected strains enormously increasing intra-abdominal pressure. In all of the cases there was immediate disability lasting from a week to several months. Five of the six patients were nulliparæ.

The symptoms may be very vague and ill defined, not suggesting the uterus as a possible etiological factor; or they may be fairly typical and present the following features. Pain is present in the sacral or sacro-iliac region. It is sometimes sharp and knifelike, in the hypogastrium or radiating to the groins or thighs. Bladder irritability is often one of the complaints, but there are no changes in the urine. There is some change in the type of menstruation. The posture and gait are affected, Barringer thinks characteristically, the patient endeavoring to protect herself from any unnecessary jarring or motion, walking and holding herself carefully. On vaginal examination, displacement of the uterus is found, generally a retro-displacement, rarely with incarceration, and occasionally with moderate degree of prolapse.

The mechanism is simple: the uterus is a movable organ and when the body of the patient stops on the arrest of the fall, the uterus continues to move to a point where the elasticity of the ligaments is overstretched, and they thus fail to restore it to its normal position. Distention of the bladder, relaxed ligaments of the uterus and empty sigmoid and rectum favor such displacement.

The treatment, replacement, if applied early, gives immediate and permanent relief. Occasionally the uterus returns with a snap to its normal position. If replacement is delayed, restoration is more difficult to accomplish and to make permanent and the sequelæ of displacement are more fully developed.

Neel[5] presents the description of an operative procedure for retro-displacement of the uterus. It is a new combination, would seem to be based on well-known and long-tried principles and has given good immediate results in something over one hundred cases. Suggested by Kelly, it was developed to its present form by Neel and slight modifications will doubtless be made by others.

In the first place it is an operation for retrodisplacement of the uterus and not for prolapse, yet it may be useful in slight degrees of descensus. It pulls the fundus forward and the cervix back. The latter is accomplished by running a non-absorbable suture in the utero-sacral ligament on each side. Tying the ends of each suture bunches the ligament by a sort of pursestring, and while it cannot give much support, assists both by lifting the cervix and by drawing it toward the sacrum.

The fundus is kept forward by a non-absorbable suture, which penetrates the fascia, muscle and peritoneum on each side of the median line and catches up the round ligament not far from the uterus. The suture is introduced so that the knot lies beneath the fascia of the rectus. The new feature is to catch, with small bites, the peritoneum from the point of perforation of the rectus along the abdominal wall to the neighborhood of the internal ring, then along the round ligament to the final point near the uterus. Thus by one suture the round ligament is caught to the anterior abdominal wall and the space between distal portion of the round ligament and the abdominal wall is obliterated. This modification of the Ohlshausen operation is in the direction of simplicity and is to be commended.

Prolapse and Spina Bifida Occulta.

Ebeler[6] reports a series of cases of prolapse of the uterus and vagina and points out, as a possible etiological factor, a nerve defect. Halban and Tandler, representing one view of prolapse, regard the pelvic musculature as the all-important fixation apparatus of the uterus, and explain congenital prolapse as due to spina bifida. Martin, representing a second view, regards the connective tissue as the decisive factor in uterine and vaginal support. Ebeler regards congenital prolapse as due to spina bifida, often of the occult type, and also attributes to similar nerve injury the acquired form. Under occult spina bifida Ebeler groups malformations of the bony canal which show externally no cleft nor a cystic tumor.

The normal sacral hiatus is about two centimeters in diameter and lies at the level of the fifth sacral vertebra, but may extend somewhat higher. In spina bifida various degrees of defect are present and may be in any portion of the canal, though occurring chiefly in the lumbo-sacral region. To this condition are to be attributed various congenital or post-natal deformities, as certain paralyses of the lower extermity and deformity of the foot, and sometimes enuresis nocturna.

Twenty-eight cases of vaginal or uterine prolapse were studied with care, especial attention being directed to the genital, neurological and x-ray examinations. In twenty-three, spina bifida was found and in five no evidence of such defect could be detected. The degree of prolapse varied from slight vaginal to extensive vaginal and total uterine. In seven cases of total prolapse, young women non-parous or having had but few children, spina bifida was present. Neurological findings were not constant but all showed some deviation from normal, in heightening, diminution or loss of reflexes. In five the fovea coccygea was marked. In twelve cases of prolapse of the vagina, older multiparæ, spina bifida was present, varying in extent with various forms of nerve disturbance.

In the other four, two cases of cystocele, one of recurrent prolapse and one of descensus of the vagina, all older multiparæ, spina bifida was present with nerve disturbances. The most constant sign was the fovea coccygea, found in seventeen of twenty-three. In none was there hypertrichosis which has been described as an occasional feature. As a control, twenty-eight gynecological patients without prolapse were examined and in only three were there signs of spina bifida occulta.

He concludes, then, that injury to the nerves, more or less extensive, produces insufficiency of the muscular apparatus of the pelvic floor so that it gives only inadequate resistance to injury.

Some Results of Ventrofixation of the Uterus.

Muret[7] discusses some of the results of direct abdominal ventrofixation of the uterus. As is well known, if such fixation is superficial, the uterus may in the course of time resume its normal position in the pelvis, acquiring also normal mobility by the stretching of the attachment. If, however, the fixation is complete and the uterus becomes in fact a part of the abdominal wall, considerable mobility may be present but it is not normal. If the abdominal wall is relaxed, and the uterus is large, the wall may be pulled in by the weight of the uterus; or, if the patient strains or coughs there may be an actual elevation of the anterior vaginal wall due to the traction by the uterus which is elevated and pulled forward by the protruding abdominal wall. This paradoxical result of straining was recently seen and felt in several of Muret's cases. If, however, the patient wore a corset which held in the abdominal wall, straining would result in an approximation of the uterus and bladder to the vulva.

Another occasional consequence of ventrofixation, especially if operation on the perineum and posterior vaginal wall is not adequately performed, is a descent of the cul-de-sac and a true enterocele, covered by posterior vaginal wall. The explanation of this condition following ventrofixation is that the displacement of the uterus forward directs the intra-abdominal pressure more effectively against the posterior vaginal wall in the cul-de-sac and stretches this non-resistant membrane. Such patients can be cured only by extensive perineal operations, almost obliterating the vagina.

On account of the danger from a median ligament following suspension of the uterus by the fundus, Muret advocates for prolapse so firm a fixation of the fundus that pulling out is impossible, and the formation of a suspensory ligament is out of the question. He discusses a series of cases of intestinal obstruction following the ventrosuspension.

Operations for Prolapse.

Vineberg[8] has devised a modification of the interposition operation for prolapse to make it applicable in cases of enlarged uterus. Here it is ordinarily not indicated. The steps until delivery of the fundus under the bladder are the same as in the usual interposition. The modification consists in amputating, after delivery, such portion of the fundus as seems superfluous. The stump of the body and the cervix are then used as in the usual operation, suturing the top of the stump close under the urethra to the subpubic fascia. Vineberg has performed the operation for several years with gratifying results.

Wertheim[9] contributes a modification of or addition to the interposition operation for prolapse of the uterus. He had already suggested suturing the body of the uterus to the levators as a means of giving greater security, and the present modification concerns the treatment of the cervix. Schultze called attention, years ago, to the fact that fixation of the fundus does not take the place of the normal supports of the uterus if these are weakened. The various operations for shortening the uterosacral ligaments, and otherwise giving support to the cervix, are an acknowledgment of the truth of Schultze's view.

In some cases of prolapse to which the interposition operation is applicable, cervical support is especially needed. Wertheim's device is to deliver the fundus as usual, making strong traction to expose the uterosacral ligaments. These are then united by linen threads to form a kind of sling, which is slipped under the cervix and on which it then rests. To accomplish this second step, the cul-de-sac is opened behind the cervix, the sling drawn down under the vaginal portion and sutured to it, and the cul-de-sac closed. The immediate result is excellent. The operation was performed at first only in cases of extensive prolapse; later in those of less displacement and recently for retrodeviations without any other operation, such as ventral suspension or fixation. Sufficient time has not elapsed for permanent results to be determined, but the immediate effect is entirely satisfactory.

After-Results of Curettage of the Uterus.

Girvin[10] reports three cases which show bad after-effects from curettage of the uterus. The symptoms suggest the possibility of too nearly complete removal of the endometrium and in one case there seemed to be stenosis of the internal os, from adhesions which were, however, easily broken up by the Goodell dilator at the second operation. Menstruation was much diminished in amount and duration in one patient, the flow appearing only part of one day. It is easy to understand how vigorous and prolonged use of the sharp curette could remove the endometrium beyond the possibility of regeneration, and this danger should be kept in mind. If one opens a uterus and notices the ease with which the endometrium can be removed by the curette, one sees that skill, and not force, is the chief factor in a successful curettage.

Blood Pressure with Myomata.

Taylor[11] and White studied a series of consecutive recent cases of fibromyoma of the uterus, in the gynecological division of the Roosevelt Hospital, in which blood pressures were recorded. Their report confirms statements found elsewhere in the literature,—that no definite relation is shown between myomata and increased blood pressure, and that the removal of the tumor, or the uterus and the tumor, has no definite effect in those cases which happen to have an increased blood pressure.

Menstruation.

Novak[12] studied a series of one hundred and fifty-nine cases in which the endometrium was removed at operation and in which the regular menstrual periodicity was present, as indicated in the complete and exact menstrual histories. As the chronology of the menstrual cycle was an important point to be investigated, all the above-mentioned data were necessary. The series includes many types of pelvic lesion, but the menstrual cycle was undisturbed.

The cases are arranged in several groups and studied from several points of view, with the following conclusions. The views expressed by Hitschmann and Adler as to the cyclical histological variations in the endometrium in different stages of the menstrual cycle are confirmed as correct, in general. It seems to be true that the more profuse the menstrual flow, the more marked the local hypertrophic changes in the endometrium; the less abundant the flow, the less striking is the local reaction.

An important exception to this rule occurs in cases of so-called congenital anteflexion. The endometrial changes are marked, indicating increased ovarian activity, but the flow is often scanty, perhaps due to a deficiency in the uterus itself,—some local factor which prevents the passage of blood from the vessels toward and into the uterine cavity. Perhaps the engorged mucosa, not depleted in the usual manner, acts as an irritant to the uterine musculature and gives rise to spasmodic and painful contractions.

The studies tend to indicate that the physiological factor is a more important element than the anatomical, in the consideration of menstrual disturbances. Novak suggests that the sterility so frequent with congenital anteflexion may be due to a physiological rather than to an anatomical defect in the uterus.

Statistics of Menstruation.

The difficulty of obtaining exact histories is shown in the experience of Sanes,[13] who gives a résumé of four thousand five hundred menstrual histories, many of which were taken again at a later time for confirmation. What is regular to one patient would seem quite irregular to another, and sometimes one finds the expression "regular, every four weeks, always on the seventh of the month."

This large group of cases of which the histories were taken, with some care to exclude opinion, as far as possible, and find out actual facts, gives a fair idea of the phenomena under discussion. Some conclusions may be noted. Seventy-five per cent. of the patients menstruated regularly and twenty-five per cent. irregularly. The most common regular type met with was that of twenty-eight days, which constituted seventy-two per cent. of this group. The thirty-day type followed next in frequency, with only three and eight-tenths per cent. and the twenty-one day type with three and three-tenths per cent. In some of the "thirty-one day" type the menstrual flow appeared monthly on the same day, independently of the number of days in the month. The most common irregular types were three to four weeks, then four to five weeks, two to three weeks, five to six weeks.

The most common ages of onset, in order of their frequency, were thirteen, fourteen, fifteen, twelve, sixteen. The age of onset did not show any relation to the regularity or irregularity of menstruation. The earliest age of onset in the series was nine years, and the latest twenty-four years.

The most common duration of menstrual flow was three days; then four to five days, three to four days, five days, seven days and four days. The irregular type of menstruation showed a larger percentage of long durations and a smaller percentage of short durations than the regular type.

The quantity of flow in forty-five per cent. of women was normal, in seventeen per cent. scant, in thirty-seven per cent. profuse. Patients with hyperthyroidism showed a very high percentage of profuse menstrual flow (sixty-five per cent.). Irregular patients showed a higher percentage of profuse flow than did the regular ones. Clots were very frequently found in the menstrual discharge, and they did not seem to be influenced by menstrual irregularity.

Forty-seven and four-tenths per cent. of the women suffered from dysmenorrhea (if the term "dysmenorrhea" is to convey the idea of discomfort). In retro-displacements, the percentage was found to be fifty and four-tenths per cent. In fifty per cent. of the dysmenorrhea cases the symptoms appeared during the flow, in twenty-nine per cent. before, in seventeen per cent. before and after, and in the rest during and after. Most frequently the dysmenorrhea appeared the day before the flow, then the first day of the flow, but it varied considerably.

Improvement in menstruation was frequently noticed with advance of menstrual life. After marriage and after childbirth the menstrual periods became more regular and the dysmenorrhea improved or disappeared entirely.

The most common ages of the menopause, in the order of their frequency, were given as fifty, forty-six, forty-eight, forty-seven, fifty-one, forty-nine, forty-four, forty-five, fifty-two. The length of menstrual life was most commonly given as thirty-seven years, then thirty-five and thirty-three. Sixty-eight reported a menstrual life of thirty years or more. The very early and the very late onset of puberty showed rather early menopause.

Operation for Menstrual Disorders.

Carstens[14] discusses those cases of menstrual disorder, dysmenorrhea or menorrhagia, which are of such a character that the patient is incapacitated during menstruation. For such when less radical methods have failed, removal of the ovaries has been suggested and is often the operation recommended. The number of cases in which a radical procedure is necessary is not large, but the condition of the patients is pitiable. Carstens advocates removing the uterus and leaving one or both ovaries, as the relief is as great as if a complete operation were performed, and the general disturbance is less marked. Rarely a second operation is necessary because of later disease in the ovary, but, if indicated, is without great risk.

Uterine Hemorrhage.

Palmer Findley[15] has prepared a collective review on uterine hemorrhage, which is a good résumé of the recent literature, and as such is hardly suitable for further abstracting and condensation. It indicates, that while certain views as to the cause of uterine hemorrhage are gradually becoming less frequent, there is not at present sufficient evidence to give the basis for the formulation of a satisfactory explanation. At the present time, to say that, in the absence of anatomical evidence of disease, the hemorrhage is due to some dysfunction of the glands of internal secretion, is no explanation; it is merely a suggestion as to where a possible explanation may lie. Here are fields for investigation and problems in abundance.

In the review, hemorrhage from obvious causes, as cancer and myoma, is considered, and the appropriate therapy outlined. A comprehensive, but not exhaustive, bibliography follows.

Changes in the Endometrium.

Owing to the peculiar changes which normally take place rhythmically in the endometrium, it is sometimes difficult to determine whether inflammation is or is not present. Endometritis, which was formerly regarded as very frequent, is thought by some to be non-existent in the absence of bacterial infection. Perhaps it is more accurate to regard the bacteria as the cause of acute endometritis. Warner[16] reports a series from which all "inflammatory cases" were excluded. All the patients were under forty years of age, and the operations were for more or less simple conditions. A careful study of specimens, referring also to the case histories and the menstrual charts, caused a revision of some of the clinical diagnoses. Of one hundred and twenty-seven cases, sixteen were found to be not inflammatory—an error of twelve per cent. Of twenty-five patients curetted in the resting stage of the menstrual cycle, with a clinical diagnosis of endometritis, all were found to have chronic endometritis, on microscopical examination. This indicates that in the absence of the changes incident to menstruation, the diagnosis can be made with much greater accuracy.

Studying the character of menstruation in connection with the histology of the endometrium, Warner confirms the opinion that the changes in the endometrium are not characteristic of the menstrual deviations, thus suggesting that the cause of abnormal menstruation lies often outside the uterus.

X-Ray in Fibroid Tumors.

Pfahler[17] reports his experience, extending over a period of nine years and comprising forty-six cases, in the treatment of myoma of the uterus with the x-ray. The method is no longer to be regarded as new and untried, for large series of cases have been reported. After studying the results, the question is simply, in what cases is the x-ray suitable?

The most important indication is hemorrhage due to myoma, but even this requires some qualifications, and these are given as follows: The treatment is indicated in all cases of myoma in older women in whom there is already a well-advanced anemia, which may be the cause of an anemic heart. Also, in all elderly or young women in whom there is marked heart disease (organic), diabetes mellitus, chronic nephritis, marked lung disease, or goiter with cardiac symptoms. All patients beyond the age of forty should try this treatment unless there is a definite contraindication.

As to contraindications, he says the following groups are not suitable: (1) all cases in which the tumor is pedunculated, or in which the tumor can be excised without endangering the reproductive powers of the patient; (2) myomata that have undergone malignant degeneration or that have become gangrenous; (3) myomata associated with disease of the adnexa; (4) myomata which are producing such marked symptoms that the patient is endangered more by waiting two or three months for results of roentgen-therapy than by the immediate results of operation.

A judgment as to the probability of cure must be based on critical reviews, in which the dosage and method of treatment, as well as the kind of case, are taken into consideration. With improvement in technic, even though the scope of the treatment is extended, the percentage of cures rises to over ninety, but it is not clear whether this refers to cure of hemorrhage or disappearance of tumor. Pfahler inclines to the view that all of the tumors will ultimately disappear.

Subsequent degeneration, though possible, seems actually to have been so infrequent that it need not be feared. Should any complication demanding operation occur during treatment, it can be performed as well as if no x-ray treatment had been undertaken. The possible dangers are very slight, with improved technic, and the method seems to Pfahler to be one in which there is everything to be gained and nothing to be lost.

Public Education as to Cancer.

Kennedy[18] makes some suggestions as to the education of the public in the matter of the early recognition of cancer of the uterus. They are less as to the manner of education than as to the matter. He says: "No diagnostic responsibility should be put on the public."

The symptoms of advanced cancer are well known, but few, even among physicians, can make a diagnosis in the early cases from the symptoms alone. Some basic facts are stated by the cancer committee of the Clinical Congress of Surgeons. "Cancer is a very common malady. In the beginning it is a strictly local process and not a blood disease. It is easily cured when removed early in its course. It is incurable in the later stages."

The first thing that should be taught is in what normal menstruation consists. Women should know that even slight deviations from this normal may be due to serious disease, perhaps cancer. The only way to find out is to go to a physician and have an examination, if he thinks it is necessary, because examination gives the only way of making a diagnosis. Mistaken ideas, false notions, prejudices and timidity on the part of the patient may lead to disaster. It has done so in the past.

It seems as if a far greater number of cures could be obtained by operation on early cases, and this is possible only through the intelligent coöperation of women with their physicians. The duty of the physician is also clear; expectant treatment until the classical symptoms are well developed often proves fatal.

Cancer and Mesothorium.

Baisch[19] reports some results of the mesothorium treatment of cancer of the uterus. In his series were one hundred cases followed personally and under control, one and three-quarters years to six months after treatment. The cases fall into three groups: (1) completely inoperable, with carcinomatous infiltration to the pelvic wall; (2) borderline operable cases in which carcinoma was outside of the uterus, but did not extend to the pelvic wall; (3) operable cases in which the disease was limited to the uterus. In this third group belong the early cases in which only a small part of the vaginal portion of the cervix was involved.

In the first group were forty-three cases. Of these, twenty had died, twenty-two were uncured, one was cured. This case was a recurrence after abdominal operation. It is the only inoperable case which was cured, and suggests that the infiltration was inflammatory. In some of these cases, although the carcinoma disappeared superficially and was no longer to be detected on removal of tissue for microscopical examination, the deep infiltration increased, the pains became worse, and the disease finally proved fatal. In others there was a marked improvement in the general as well as in the local condition, and some even regarded themselves as cured because of the disappearance of the bleeding and discharge, and the improvement in the general health. As a palliative treatment for inoperable carcinoma, there is, according to Baisch, nothing better known than mesothorium and radium.

In the second group were twenty cases. The operative results in this group are well known,—high primary mortality, poor permanent results. Of this group four had died, six were uncured, ten were cured. Three of the cured cases were recurrence after vaginal hysterectomies. Here the results are most striking, for there was complete macroscopical disappearance of growth, even on careful palpation.

In the third group were thirty-seven cases. Of these, five had died, four were uncured, and twenty-eight were cured. Some of the cases that died proved not to be early, as there was metastases to glands. Of the early cases, eight in number, all were cured, twenty-two to six months.

The results of operation and of mesothorium treatment are next compared. In one hundred cases of cancer, fifty-seven per cent. were operable, which is about the operability now generally found. Of these, nine died. If one reckons the primary operative mortality is sixteen per cent., which is too low rather than too high, then by the operation alone there were lost as many patients as by the whole of the non-operative treatment, which in itself kills none. There were thirty-nine patients temporarily healed, that is, about sixty-eight per cent. free for one year, which compares favorably with the results after operation. Winter, in one hundred recurrences, found one hundred and fifteen in the first year, and thirteen in the second. So that for the first year, mesothorium gives a distinct improvement.

Baisch draws the following conclusions: (1) In completely inoperable cases mesothorium and radium fail to cure, but they give the best palliative therapy. (2) In operable cases the temporary results are better than by operation over the same period of time. (3) In operable cases the less advanced the growth, the more favorable the prognosis.

Cancer and Radium.

Kelly[20] and Burnam report more favorable results from the use of radium in cases similar to those described by Baisch. The classification is somewhat different. They have three groups: (1) operable, "growth not fixed to pelvic wall, on either side, has not caused hydronephrosis, not associated with pelvic pain"; (2) "by inoperable cancers are meant those associated with general metastases, those firmly fixed to one or both pelvic walls, those extensively involving the bladder, vagina or rectum"; (3) recurrent inoperable growths. That the two series of cases are not exactly comparable is shown by the operability, only fourteen of the series of two hundred and thirteen cases of Kelly and Burnam being reckoned as operable. Their results are more favorable.

Of the fourteen operable cases, ten were operated upon and treated prophylactically with radium. All were living and well from three years to six months after the treatment. The same was true of the four cases which were not operated upon on account of general contraindications. Of one hundred and nineteen inoperable cases, fifty-three were clinically cured, one hundred and nine markedly improved, thirty-seven not improved. But nothing is said of any deaths.

In both series of cases the time of observation is still too short to justify more than qualified conclusions as to the efficacy of radium.

Some workers with radium and mesothorium are less enthusiastic. Ascheim[21] and Meidner report in detail a series of seventeen cases on which they comment at some length. Their conclusions are, in brief, that radiotherapy is the best palliative method of treatment for ineradicable or otherwise inoperable tumors. If the case is operable, operation is advocated strongly, on account of the unfavorable results in two cases in which, at the request of the patients, radiation was employed. Operation is by no means the antiquated therapeutic resource that some advocates of radium therapy would have it considered. The time for operation is as soon as possible, and according to their experience, radiation before operation is best omitted.

Cancer and X-Ray.

Case[22] presents a summary of the roentgen treatment of uterine carcinoma, dealing with results and present technic. The study is based on reports in the literature as well as on his own experience, and gives a comprehensive and apparently just appreciation of the method.

New developments in roentgenology, in the production of more powerful apparatus and in the refinement of therapeutic methods make the results now obtainable scarcely comparable with those which were attained ten years ago. Massive doses, at least one hundred times the maximum dose then considered safe, may now be used, but such doses, if employed without skill, are extremely dangerous.

Radium and roentgen therapy are very closely related both as to theory of effect and principles of application. Some consider radium far more satisfactory in the treatment of deep carcinoma, while Bumm is a strong advocate of the use of the x-ray in such cases. By the use of the most recent advances in technic, results with the x-ray may really be considered brilliant. As to cure, sufficient time has not elapsed for conclusions as to the permanent results of x-ray or radium.

If the dosage is not sufficient to cause damage to the adjoining tissue, there is danger from inadequacy. Stimulation of cancer may result from small doses—a very real danger, borne out by histological examination of a specimen in which there was superficial necrosis, but deep stimulation of growth. Though it is not proper to speak of the selective action of the x-ray on the malignant growth it is true that carcinoma tissues are quite sensitive to the x-ray. Cancer cells may be destroyed with no sign of injury to the surrounding tissue; but in comparison with some other tumors, for example, lymphomata and certain sarcomata, carcinoma is less sensitive.

Certain untoward effects are observed in spite of all the precautions at present known. They are, however, relatively unimportant compared with the serious and disagreeable nature of the symptoms of carcinoma. Some of these effects are due to the rays themselves and to the changes brought about in the room by the high tension currents. Others are due to acidosis brought about by the absorption of the products of cell destruction. Bladder irritation is occasionally distressing, but rectal tenesmus is less frequent than after the use of radium.

Late skin effects must be kept in mind, occurring in cases in which there was no visible sign of injury just after the treatment. The latent period of such affections seems to have been greatly lengthened by improved methods of filtration, but the untoward changes have been encountered as late as a year and a half after irradiation.

The opinion is rather widespread, that only inoperable or borderline cases should be subjected to x-ray treatment. For the rest, operation is still the method of choice, but palliative results have been most gratifying. In case of operation, there should be post-operative radiation just as thoroughly as if no operation had been performed.

Cancer and Operation.

The use of the Percy cautery as a preliminary to removal of the uterus, in operable cases of cancer of the uterus, is recommended by Clark.[23]

If the cancer cells are destroyed by the heat—and those on the surface certainly are—this method would seem to diminish the danger of implantation metastases by manipulation of the growth during removal. Clark advocates its use immediately before the radical operation, employing the cautery as recommended by Percy, with the hand in the abdomen as a control of the heat.

Hutchins[24] calls attention to the discredit which has been and will be brought on radical operating for cancer of the cervix if that method of treatment is not appropriately applied. To determine whether the cancer is or is not eradicable, it may be necessary to open the abdomen. In doubtful cases the competent operator will not hesitate as to this step. But when the abdomen is open, it is possible to determine, with a reasonable degree of certainty, that the growth can or cannot be removed. It is at this point that Hutchins advocates "conservative radicalism."

If the involvement is such that complete removal of the cancer, not simply of the uterus, is improbable, apparently impossible, the surgeon should be perfectly honest and say, "This patient has in reality no chance of cure by operation and I will not attempt extirpation"; instead of soothing his conscience by saying he gave the patient her only chance, by performing an incomplete operation. "Radical operation" has its place, but it should not be discredited by misapplication.

Cancer after Supravaginal Hysterectomy.

Tyler[25] reports a case of carcinomatous cauliflower growth in the cervical stump six years after subtotal hysterectomy for pelvic inflammatory disease. The ovaries also had been removed. Vaginal removal of the cervix did not prevent recurrence, and the patient died in less than a year from the time that the cancer was discovered.

Tyler has reviewed the literature carefully and finds such post-operative cancer more frequent than is generally thought,—somewhat over two hundred cases of malignant degeneration of the cervical stump. In some of these, the cancer was undoubtedly overlooked at the primary operation, but even then the number is large enough to deserve consideration.

Replies to a widely distributed questionnaire indicate that the complete hysterectomy is growing in favor in cases of myoma uteri, although excision or cauterization of the cervical mucous membrane is widely employed. The greater morbidity and mortality of the complete operation still deter many operators. One point which should be considered in determining the choice of operation is the relative frequency, overlooked by Tyler as by many others. For example, if it should be found that complete hysterectomy gives two per cent. greater mortality, and cancer occurs following operation in only one-fourth of one per cent. of supravaginal hysterectomies for myoma, supravaginal hysterectomy would be the operation of choice. But this question of relative frequency has not yet been fully investigated.

References.

[1] Wile and Senear: Surg., Gyn. and Obst., 1915, Vol. xxi, p. 643.
[2] Boldt: Jour. Am. Med. Asso., 1915, Vol. lxv, p. 1511.
[3] Sturmdorf: Surg., Gyn. and Obst. 1916, Vol. xxii, p 93.
[4] Barringer: Am. Jour. Obst., Vol. lxxi, p. 758.
[5] Neel: Surg., Gyn. and Obst., Vol. xxii, p. 253.
[6] Ebeler: Zent. f. Gyn., 1916, p. 166.
[7] Muret: Ann. d. Gyn. et d'Obst., 1915, Vol. xli, p. 545.
[8] Vineberg: Surg., Gyn. and Obst., 1915, No. 6, p. 741.
[9] Wertheim: Zent. f. Gyn., 1916, p. 1.
[10] Girvin: Am. Jour Obst., 1915, Vol. lxxii, p. 632.
[11] Taylor and White: Surg., Gyn. and Obst., 1916, Vol. xxii, p. 217
[12] Novak: Surg., Gyn. and Obst., Vol. xxi, p. 336.
[13] Sanes: Amer. Jour. Obst., 1916, Vol lxxiii, p. 93.
[14] Carstens: Trans. Am. Asso. Obst. and Gyn., 1915.
[15] Findley: Internat. Abstr. Surg., March, 1916.
[16] Warner: N. Y. Med. Jour., 1915, Vol. ci, p. 1213.
[17] Pfahler: Amer. Jour. Obst., 1915, Vol. lxxii, p. 79.
[18] Kennedy: Jour. Indiana State Med. Asso., 1915, Vol. viii, p. 277.
[19] Baisch: Muench. Med. Wch., 1915, Vol. lxii, p. 1670.
[20] Kelly and Burnam: Jour. Am. Med. Asso., 1916, p. 298.
[21] Ascheim and Meidner: Zeitsch. f. Geb. u. Gyn., 1915, Vol. lxxvii, p. 82.
[22] Case: Surg., Gyn. and Obst., Vol. xxii, p. 429.
[23] Clark: Surg., Gyn., and Obst., Vol. xx, p. 558.
[24] Hutchins: Boston Medical and Surgical Journal, 1915, Vol. clxxiii, p. 97.
[25] Tyler: South. Med. Jour., 1915, Vol. viii, p. 583.

Reports of Societies.

NEW ENGLAND PEDIATRIC SOCIETY.

The forty-fifth meeting was held at the Boston Medical Library, December 29, 1916, the President, Dr. A. C. Eastman, of Springfield, in the chair.

The following papers were read:

1. Case report, Wyman Whittemore, M.D., Boston.
2. Some Observations With Sour Milk Feeding, C. K. Johnson, M.D., Burlington, Vermont.
3. Should all Milk be Pasteurized? R. S. Eustis, M.D., Boston.

The following officers were elected for the ensuing year:

President, Dr. Maynard Ladd of Boston; Vice-president, Dr. Charles K. Johnson of Burlington, Vermont; secretary and treasurer, Dr. Richard M. Smith of Boston; member of Council for three years, Dr. William W. Howell of Boston.

STRANGULATED INGUINAL HERNIA WITH A GANGRENOUS APPENDIX.

By Wyman Whittemore, M.D., Boston.

About a month ago I was called out of town in the evening, to see a baby who seemed, from the doctor's account, to have a strangulated hernia. Upon arriving at my destination, I found a baby, one of twins, who had weighed three and a half pounds at birth, and who now, at the age of seven weeks and one day, weighed exactly five pounds. The other twin had died at birth. The mother had nursed the surviving baby for three or four weeks, and since then he had been bottle-fed.

Two days before I was called to see him, his mother had noticed a swelling in the left scrotum, but after a family consultation decided it was nothing to worry about. The next day he vomited a small amount in the morning, and again in the evening, but slept well during the night. The following day he seemed pretty well, but did not take his bottle as eagerly as usual. He slept off and on during the day, and in the afternoon, as his bowels had not moved for forty-eight hours, was given an enema. This was returned with one small sky-ball. Towards evening, while being bathed, he vomited violently, quite suddenly. This sufficiently alarmed his mother to induce her to call in medical assistance.

When I saw the baby, at nine o'clock that night, he seemed to be very comfortable and was sleeping. His abdomen was considerably distended and tympanitic all over. The left side of the scrotum was swollen, tense, and shiny, and about the size of an ordinary hen's egg. It looked very much like a hydrocele. It did not seem to be tender, but the inguinal region was indurated and slightly tender. The diagnosis of a strangulated inguinal hernia seemed to be obvious, and the parents agreed to an immediate operation.

On opening the sac, a little turbid fluid escaped. The sac contained a small piece of the caecum, and, to my great surprise, a black, swollen, rigid appendix with fibrin on the outside. The appendix was removed and the caecum reduced into the abdomen, after enlarging the opening, and the wound sewed up without any drainage.

The baby came out of ether without vomiting. His bowels moved twice during the night with enemata. He made a very quick and easy recovery, and, I am glad to be able to say, is now well.

I report this case to you on account of the unusual combination of a baby seven weeks old, and weighing only five pounds, having a strangulated hernia with a gangrenous appendix.

Discussion.

Dr. Stone: The case which Dr. Whittemore has reported is most interesting. It presents rather characteristic symptoms similar to those present in some cases that we have seen at the Children's Hospital. It is not uncommon to find the appendix present in a hernial sac in an infant. We have seen some cases in which there has been acute appendicitis in the hernial sac. In making a diagnosis one other condition is to be considered, namely, an infected hydrocele cord. In both of these conditions the symptoms of intestinal obstruction are lacking, but the toxic symptoms may be rather marked, especially so in the case of gangrenous appendicitis. Of course it is unnecessary to warn against the extreme danger of taxis in these cases.

SOME OBSERVATIONS WITH SOUR MILK FEEDING.

By C. K. Johnson, M.D., Burlington, Vt.

In presenting this paper I may be touching on points familiar to many of you, but my results with a few infants fed on sour milk prompted me to report them. My first personal observation of sour milk feeding was accidental. An infant that had been tried on several formulae with very poor success had been given sour milk, and the weight increased from the first, at five and one half months weighing seventeen pounds; it was firm, strong and in excellent condition.

My formula has been as follows: One quart of milk was allowed to sour until well curdled; naturally, if conditions were favorable, otherwise lactic acid cultures were added; it was then churned twenty minutes, one ounce granulated sugar was added, or in older infants part of the carbohydrate was added in the form of wheat flour. The mixture was then brought to a boil.

I first tried this feeding cautiously and soon discovered that certain infants did remarkably well on it, especially in an improvement in the stools.

Recent literature gives scant mention of sour milk, while its mention in earlier writings was not uncommon. Dr. Kerley reports two series of infants fed on a sour milk formula, but does not give the formula used. One of his series was feeding cases that were not thriving. All but one lost weight. A second group of nineteen infants all had intestinal disease. Only four gained in weight.

The following case histories are taken as representative of my series.

Case 1. Male, 6 months old, sent to hospital from a distant town, July 15, 1916. No history obtainable. This infant was marasmic, stools undigested and frequent, weight 8 pounds. Milk and barley water was prescribed and there was slow improvement, but the stools were variable. On August 18th, the weight was nine pounds. At this time the food was changed to sour milk, there was improvement in the stools and general condition from the first. This infant was sent home September 29th, the weight then being eleven pounds and its condition good.

Case 2. Beatrice F., aged 4 months, admitted to hospital September 10, 1916. Weight six pounds. She was pale and much emaciated, stools alkaline, cheesy with foul odor, temperature 101°F. This infant had been much over-fed on a plain milk-and-water mixture, nearly one quart of milk being given each 24 hours. Castor oil was given and sour milk prescribed. Two ounces milk and 2 ounces water, every three hours. The food was well taken, the stools soon improved and she was discharged September 29th, much improved, the weight being eight pounds. A change to milk and barley water was made before she left the hospital. This infant was seen some two months later and was doing well.

Case 3. Male, 10 months, seen in a distant town, September 22, 1916. This infant had been taking whole milk and oat gruel; diarrhea had developed one month previous and various attempts to get back to a milk formula had failed. At this time condensed milk and barley water was being given. The stools were loose and sour, temperature normal. The infant was pale and flabby, and had lost three pounds. Sour milk three ounces, and water two ounces were ordered every three hours, six feedings. The first two or three feedings were resisted, then the food was readily taken. The stools soon became fewer, firmer, and well digested. A short time after this I had this boy under closer supervision and the stools continued good, the infant contented, but the weight remained nearly stationary. After three weeks a change was made easily to a whole milk, barley and dextri-maltose mixture and the weight increased.

Case 4. Male, 2½ months of age, weight ten pounds, developed enteritis in July, 1916. The bowel condition being persistent, the infant was sent to the hospital under my service, July 28. The stools frequent, loose and of a foul odor. The buttocks were much excoriated and the infant was covered with boils, pus oozing out in numerous places on slight pressure. Culture showed nearly pure culture of staphylococcus. An autogenous vaccine was used and the skin cleared remarkably. This infant was given barley water and later a whole milk mixture. The stools improved, but attempts to strengthen the formula caused a return of undigested stools. August 17th, a change was made to sour milk. From this time there was a steady gain in weight, at six months weighing 17 pounds. The infant is contented, firm and nearly sits alone.

Case 5. Male, birth weight 9½ pounds. First seen at three months of age, August, 1916. This infant had been artifically fed from birth, various foods having been tried. Weight when seen was ten pounds. The food consisted of one quart milk and one quart water in each twenty-four hours. The stools were alkaline, loose and of foul odor. The general nutrition was very poor. Sour milk was prescribed and well taken, the abdominal distention decreased and the stools showed good digestion. The stools continued good and the infant contented, but the weight increased but slowly, so at the end of three weeks a change was easily made to a citrated whole milk dilution. There has been a continued improvement from this time.

I tried sour milk, 50%, in water with six healthy new-born infants and found that the stools became yellow and pasty somewhat more quickly than is usual when ordinary milk mixtures are given. More calories were taken than I usually prescribe at this age. The infants were contented, but at the end of a four-week period all showed a stationary or slight loss in weight. It may be that I overfed these infants.

I have used sour milk with a considerable number of infants over short periods with marked improvement in the stools, then changing to a simple milk formula.

As a rule the food was well taken, even eagerly, and the infants were contented.

From my few cases I will not attempt to add any conclusions, neither would I advocate sour milk for well infants. I do, however, feel that I get very satisfactory results with some infants with persistent undigested stools or diarrhea, using it usually over short periods, after which a change to a simple formula is more easily done.

A few infants continue to thrive on this feeding and develop normally.

Discussion.

Dr. Talbot: My experience has been with lactic acid milk, or buttermilk, is not indicated in all instances and that all children do not do well on it. On the other hand, many children do very well and their troubles are straightened out quickly by it.

Dr. Percy: I was much interested in what Dr. Johnson had to say about "sour milk" feeding. Dr. Johnson has spoken of cases which had a certain amount of fat intolerance. This applies to a good many infants who do not gain weight and who do well on other kinds of food. If you go back carefully in the history of these cases, there is most always a history of previous diarrheal conditions. In our opinion these are probably sugar intolerance with a secondary fat intolerance. There have been a good many cases at the Children's Hospital with the straight diagnosis of fat intolerance who have done well on lactic acid milk feeding.

In the success of "sour milk" feeding comes the question whether the efficacy of this feeding is not due to a diminution in sugar. I noted that Dr. Johnson added extra sugar and that the sugar added was in the form of cane sugar rather than in the form of lactose.

I wish Dr. Johnson had been able to report to us other cases in children, which to my mind fall into this class of cases, i. e., diarrheas needing lactic acid milk due to sugar or to the starch. These apparently do well only on a low sugar, and exceedingly well on precipitated lactic acid and high protein type of food.

Dr. Morse: I object most strongly to the term "sour milk feeding." I do not think we ought to use the term so loosely. Sour milk feeding may mean almost anything. It may mean feeding a baby with straight sour milk or sour milk which has been boiled, or sour milk or sour skimmed milk, or a modified milk which has been soured in some way.

This method of feeding which Dr. Johnson has just told us about was described over and over again in the literature of ten and fifteen years ago, and the results given in detail.

It seems to me that we must distinguish very carefully between milk which has been soured with lactic acid organisms, and given raw, and milk which has been heated before it has been given. If the milk is boiled the casein is not coagulated by rennin anyway. When the sour milk has been boiled, therefore, it is impossible to know whether the good results are due to the lactic acid organisms or to the boiling of the mixture. I do think that we ought to be very careful in our use of the term "sour milk feeding."

Dr. Dunn: I quite agree with Dr. Johnson that there are a great many infants who do better when fed on a milk which contains lactic acid produced by the lactic acid fermentation. We have been very much interested in this matter at the Infants' Hospital, and have been trying to obtain evidence as to the reason for the good results observed with lactic acid milk, and also evidence as to the clinical type of case in which sour milk is indicated, or contraindicated.

The points in which sour milk or lactic acid milk differs from ordinary milk are, first, that it contains lactic acid or the bacteria which produce lactic acid; and second, that the casein is precipitated in a very finely divided form. These seem to be the essential differences. Of course, when, as is often done, the lactic acid milk is prepared from fat-free milk, or from skimmed milk, the fat content is necessarily low. Also, unless extra carbohydrate is added, as was done in Dr. Johnson's case, the carbohydrate content is low because a certain amount of sugar is used up in the process of fermentation.

Various reasons have been brought forward as to the advantage of lactic acid milk. One explanation is that the low fat and sugar content, together with the high casein content, the casein being in a form which makes it very easily digestible, are especially suited to the digestive idiosyncrasies seen in a certain class of cases. Another explanation is, that the presence of lactic acid bacilli and the freshly formed lactic acid exercises an inhibitory action upon certain harmful forms of bacterial fermentation in the intestine.

In order to throw light on these questions, the babies at the Infants' Hospital who were doing well on lactic acid milk, were then given a food which was made as nearly as possible of the same composition, in so far as the actual amount of fat, carbohydrate, and protein was concerned. The casein, however, instead of being precipitated by lactic acid, was previously precipitated by rennin, ground up fine, and then added to the food. The idea of this procedure was to exclude the lactic acid, and thus determine whether this or the composition of the food in fat, carbohydrate, and protein was the cause of the favorable result. We found that some cases did equally well on a food of similar composition without the lactic acid, but that others did not do so well. We concluded that in some cases the favorable results of feeding with lactic acid milk are due to the comparatively low fat and carbohydrate content of the food, and to the fact that the casein is in a particularly digestible form, but that in other cases the good results are due to some specific action of the lactic acid bacillus or its products.

In so far as clinical indications are concerned, we have found that the cases which do best on lactic acid milk are acute diarrheas, and chronic cases in which there is a marked intolerance of fat, of carbohydrate, or of both. The clinical type of case which is sometimes made worse by lactic acid milk, is that in which vomiting is the principal symptom.

SHOULD ALL MILK BE PASTEURIZED?

BY RICHARD S. EUSTIS, M.D., BOSTON.

(Abstract.)

New York City already requires the pasteurization of all milk below certified grade, and other cities are tending in that direction. There is a fair chance that the advocates of pasteurization may persuade the health authorities to forbid the sale of any raw milk. So far no convincing arguments have been brought forward against the feeding of babies on pasteurized milk. We have nothing but the opinions of the leading pediatricians of the country that babies fed on raw milk do better than those fed on heated milk. Even if scurvy is more prevalent on a diet of pasteurized milk it is easily prevented or cured. On the other side there are in raw milk the very real dangers of tuberculosis and the other milk-borne diseases. Even with the greatest care these diseases cannot be absolutely excluded. Certainly, therefore, all milk below the grade of certified should be pasteurized, but if pasteurization is required, it should be done under official supervision.

Conclusions: Compulsory pasteurization under the control of the health authorities seems advisable. Provision should be made, however, for the sake of those who desire a clean, safe, raw, milk, for the sale of unheated milk, conforming to the essential features of certified milk. The production of such milk should be under the closest supervision by a medical milk commission or by the health departments.

DISCUSSION.

DR. TALBOT: I am very glad that Dr. Eustis has brought this subject before your attention again. There is no question but that pasteurized milk is safer for a baby than raw milk, although all reasonable precautions have been taken with raw certified milk.

Raw certified milk is as safe as any milk that we can get that is not pasteurized. I think it is better for a baby to be on pasteurized milk and not get tuberculosis, than to be on certified milk and get tuberculosis.

Book Review.

The Proceedings of the Charaka Club. Vol. IV. New York: William Wood & Company. 1916.

Previous volumes of the proceedings of the Charaka Club have always been reviewed with interest in the JOURNAL. This fourth volume, in addition to the articles printed, contains a record of papers read and subjects discussed at the meetings of the Club since the publication of Volume III. This list of thirty-seven titles affords a further and illuminating glimpse into the background of the life of this interesting organization beyond what is represented in its published transactions.

Of the dozen papers which make up the present volume, two by Dr. Gerster deal with Professor Harnack's medical data from the oldest church history and with the biography of Antonio Scarpa, whom the Basle nomenclature has so rudely dispossessed from remembrance by medical students for his fascia and his triangle. There are two articles also by Dr. Walton, one on the medical saints, Cosmo and Damian, with beautiful reproductions of mosaics, coins and paintings, representing incidents in their lives; and the other on Bacon and Shakespere from the botanical point of view. The latter is delightful for the originality of its point of view, though even with its modestly undogmatic conclusions about the Baconian origin of the Shakespearian drama, we cannot agree. Dr. Joseph Collins contributes two scholarly papers on "Literary Leanings of Eighteenth Century Physicians" and on "Medicine in England in Chaucer's Time;" and Dr. Charles L. Dana writes on "The Development of Anatomical Illustrations of the Nervous System," with twenty beautiful plate reproductions from the fifteenth and sixteenth centuries, and on the costume of the ancient Greek physician, with a reproduction of a figure wearing the chiton and chlamys. Dr. Streeter pleasantly describes his rare fourteenth century English manuscript of Guy de Chauliac; and there is a sketch of the University of Alexandria by the late Dr. Mumford, in the fascinating literary style whose loss will be as much felt in future volumes of the Club as that of his charming and cultured personality must be at its meetings.

THE BOSTON
Medical and Surgical Journal
Established in 1812

An independently owned Journal of Medicine and Surgery published weekly under the direction of the Editors and an Advisory Committee, by the Boston Medical and Surgical Journal Society, Inc.

THURSDAY, MAY 17, 1917

Editors
Robert M. Green, M.D., *Editor-in-Chief*
George G. Smith, M.D., *Assistant Editor*
Walter L. Burrage, M.D. *For the Massachusetts Medical Society*

Committee of Consulting Editors
Walter B. Cannon, M.D.
Harvey Cushing, M.D.
David L. Edsall, M.D.
Reid Hunt, M.D.
Roger I. Lee, M.D.
Allan J. McLaughlin, M.D.
Robert B. Osgood, M.D.
Milton J. Rosenau, M.D.
Edward C. Streeter, M.D.

Advisory Committee
Edward C. Streeter, M.D., Boston, *Chairman*
Walter P. Bowers, M.D., Clinton
Homer Gage, M.D., Worcester
Joel E. Goldthwait, M.D., Boston
Lyman A. Jones, M.D., Boston
Robert B. Osgood, M.D., Boston
Hugh Williams, M.D., Boston
Alfred Worcester, M.D., Waltham

Subscription Terms: *$5.00 per year, in advance, postage paid, for the United States. $6.56 per year for all foreign countries belonging to the Postal Union.*

An editor will be in the editorial office daily, except Sunday, from twelve to one-thirty p. m.

Papers for publication, and all other communications for the Editorial Department, should be addressed to the Editor, 126 Massachusetts Ave., Boston. Notices and other material for the editorial pages must be received not later than noon on the Saturday preceding the date of publication.. Orders for reprints must be returned in writing to the printer with the galley proof of papers. The Journal will furnish one hundred reprints free to the author, upon his written request.

The Journal does not hold itself responsible for any opinions or sentiments advanced by any contributor in any article published in its columns.

All letters containing business communications, or referring to the publication, subscription, or advertising department of the Journal, should be addressed to

Ernest Gregory, *Manager*,

126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

RATIONAL ECONOMY OF DIET.

While a great deal of investigation and experimentation has been carried on along the line of dietetics in general, and dietetic economy especially, in relation to minimum body needs and to nutrition, a great deal more must yet be known about food and metabolism before any very definite, hard and fast rules can be laid down in respect to diet. Caloric feeding and balancing of the ration are, unfortunately, still rather vague terms, and the extravagant but indiscriminate use of these terms, especially in the interest of food economy, is hardly justified. The movement for food economy is rightly gaining much ground because of the present crisis; and for this reason more than ever is it necessary that as clear an understanding of the food needs be had as is possible, under the present knowledge of the subject, before making any recommendations.

There is at present a great demand for "caloric feeding" and for food of high caloric value. In the prolonged febrile conditions, because of the great loss of heat, the feeding of foods having a high combustive or caloric value has proved to be of great benefit. It is in typhoid fever where caloric feeding has been extensively tried and with much success. During the febrile period, in order to maintain the heat and the vitality, almost every food consideration had to be sacrificed in favor of foods of high caloric value. And fortunately, too, high calory food is almost entirely digested and leaves little residue to irritate or injure the intestinal tract at a time where that would be disastrous. Such food can be given in relatively large quantities without increasing the tendency to intestinal hemorrhage or perforation. Carbohydrates and fats are the foods of election. But with this type of disease the usefulness of caloric feeding ends.

The introduction of caloric feeding for healthy individuals, from considerations of economy, is not satisfactory chieflly because no one type of food can supply the nutritional needs of the body. Caloric feeding in disease is neither entirely rational nor wholly ideal, but merely the most expedient under the circumstances; but this expediency does not extend to health. A preponderance of high caloric food cannot be a balancing of the ration. The healthy body needs other food besides the heat-giving kind. This sort of food has, moreover, a disadvantage in being entirely consumed—namely, there is left so little solid residue that the intestinal canal cannot act properly. Any advantages are immediately offset by constipation thus induced. In typhoid fever, for example, this is an advantage.

Moreover, a preponderance of high caloric non-protein food cannot supply the place of the protein need of the body indefinitely. High calory food is of great value to those whose occupations require a great deal of body heat, provided there accompanies it a sufficient amount of non-caloric protein food to balance the ration. It seems, also, that food high in heat-giving qualities is low in vitamine. The disregard of vitamine in favor of calories may cause nutritional disturbances of great severity if persisted in for long periods. Vitamines are particularly abundant in fresh milk, eggs, meat, grain, and yeast extract. All these food products are rather expensive and not usually embraced in the foods recommended in economy movements. Indeed, it seems that the higher the vitamine content of a food the higher its cost. But the body economy—metabolism—does not tolerate a food economy that ignores the vitamine or does not allow a balancing of the food ration. Economy in food must be rather in quantity, in simplicity of menu, but yet not at the sacrifice of food variety. One type of food, whether high or low calory, is extremely undesirable. A proper diet must take account of all the food elements needed for the nutrition of the organism.

PHYSIQUE AND THE MILITARY AGE.

What is a seeming incongruity in the selection of first line recruits from among the younger generation rather than from among those in the prime of life, physically as well as mentally, is resolved on a closer consideration of the physical qualities of the two classes. While it does seem that the younger individual is poorer in general muscular development and in physical endurance when in the ages between 19 and 23 than is the individual of middle life, it is nevertheless a fact that, although there is relative lessening of muscular development and apparently a commensurate lessening of the endurance, the younger individual with this lessened muscular power has a great deal of reserve power—the principal factor in physical endurance—and a great deal more than the older individual. In respect to the general musculature, there is the same proportion between the power necessary to drive the human machine and the actual power that can be generated as a maximum as there is in the heart. The actual power needed is very much the smaller part of the maximum. In older persons there may be a greater degree of actual absolute power, but nearly all of it is necessary to drive the human machine or the human heart during ordinary physical needs. When called upon for a great effort or for a great deal of endurance, as in military operation, it is usually deficient rather in proportion to the age of the individual than to his actual physical development. The untrained young have a great deal more reserve power than the untrained older individual of greater muscular power and muscular development. The young athlete, trained for competitive effort rather than for general athletic ability, is very much in the same position with his greater muscular power and muscular development as is the older individual with similar development. The athlete may have developed a great deal of actual muscular power, but all of it is usually necessary to drive his greater and heavier machinery. His hypertrophied heart is necessary, not only for his athletic activities, but as well for his ordinary life needs. He is usually a bad risk. His mortality is higher from such diseases as pneumonia, where an extraordinary tax is put on the heart reserve. It is not the quantum of actual strength that counts, but the quantum of reserve power. The advantage of universal military training, at least as a factor in general physical development, over the competitive athletic activities of the colleges and the universities, is that, while in the latter only a few are trained at all, and these few to the point of heart hypertrophy, high blood pressure and arterial fibrosis, in the former every individual is developed and trained within normal limits rather than to unusual limits, and often to the pathological degrees.

Moreover, the power for regeneration and rejuvenation is higher among the younger than among the older. The young recuperate very rapidly, even from severe conditions. They eliminate fatigue products very quickly. The ability of the young for regeneration and rejuvenation is an important factor in the healing of wounds, and repair of bones. Because the older person represents a more highly differentiated cell-organism, he is less able to adapt himself physically to the rapidly changing environment, and is in so much less useful as a soldier.

HARVARD BASE HOSPITAL UNIT

On May 1 it was announced from Washington that in response to the urgent request of the European Allies, whose commissioners are now visiting America, the United States will immediately mobilize and send to Europe for service, presumably somewhere in France, six of its base hospital units which were organized in this country last year. The following are the units selected, with their chiefs of staff:

Base Hospital No. 2, organized at the Presbyterian Hospital, New York, Dr. E. G. Brewer, director; No. 4, Lakeside Hospital, Cleveland, Dr. George W. Crile; No. 5, Medical School of Harvard, Dr. Harvey Cushing; No. 10, Pennsylvania Hospital, Philadelphia, Dr. Richard Harte; No. 12, Northwestern University, Evanston, Ill., Dr. Frederick Besley; No. 21, Washington University Hospital, St. Louis, Dr Frederick T. Murphy.

The complete personnel of the Boston unit selected (No. 5) and of the other two units from this city is as follows:

PETER BENT BRIGHAM HOSPITAL AND HARVARD MEDICAL SCHOOL.

Base Hospital Unit (No. 5).

Director—Dr. Harvey Cushing.

Assistant directors—Dr. Richard P. Strong, Dr. Roger I. Lee and Dr. Harvey Cushing.

Adjutant—Dr. William S. McCann.

Quartermaster—Capt. Augustus G. Reynolds.

Surgeons—Dr. George S. Derby, Dr. Robert B. Osgood, Dr. Edward B. Towne, Dr. Walter M. Boothby, Dr. Frank R. Ober, Dr. Gilbert Horrax, Dr. Samuel C. Harvey, Dr. Harris H. Vail, Dr. Thomas R. Goethals, Dr. William H. Potter (dental surgeon), Dr. Roger B. Taft (assistant dental surgeon).

Physicians—Dr. Walter B. Cannon, Dr. Reginald Fitz, Dr. Oswald H. Robertson, Dr. George P. Denny, Dr. George H. Minot and Dr. Harry Lyman.

Roentgenologist—Dr. Percy Brown.

Bacteriologist—Dr. James L. Stoddard.

Superintendent of nurses—Carrie M. Hall.

MASSACHUSETTS GENERAL HOSPITAL.

Base Hospital Unit (No. 6).

Director—Dr. Frederic A. Washburn.

Adjutant—Dr. Byam Hollings.

Assistant directors—Surgical section, Dr. Lincoln Davis; medical section, Dr. Richard C. Cabot; laboratory section, Dr. J. Homer Wright.

Surgeons—Dr. Zabdiel B. Adams, Dr. Beth Vincent, Dr. William J. Mixter, Dr. Ralph A. Hatch, Dr. Elliott C. Cutler, Dr. Arthur W. Allen, Dr. George A. Leland, Jr., Dr. Leroy M. S. Miner (dentist), Dr. Harold G. Tobey and Dr. Charles W. Ringer (dentist).

Physicians—Dr. Arthur W. Sellards, Dr. George Clymer, Dr. Paul D. White, Dr James H. Means and Dr. Wade S. Wright.

Bacteriologist—Dr. Roger Kinnicutt.

Roentgenologist—Dr. George W. Holmes.

BOSTON CITY HOSPITAL.

Base Hospital Unit (No. 7).

Director—Dr. John J. Dowling.

Chief of surgical staff—Dr. Edward H. Nichols.

Chief of medical service—Dr. J. J. Thomas.

Staff physicians—Dr. William H. Robey, Jr., Dr. Francis W. Palfrey, Dr. Cadis Phipps, Dr. W. Richard Ohler, Dr. Albert A. Hornor.

Staff surgeons—Dr. John Bapst Blake, Dr. Walter C. Howe, Dr. Halsey B. Loder, Dr. Somers Fraser, Dr. Irving J. Walker, Dr. Robert C. Cochrane.

Ophthalmologist—Dr. Allen Greenwood.

Otologist and laryngologist—Dr. Calvin B. Faunce.

X-ray—Dr. Arial W. George.

Pathologist (chief of laboratory service)—Dr. Edgar M. Medlar.

Chaplain—Rev. Frederick M. Eliot.

Bacteriologist—Dr. Leroy U. Gardner.

Adjutant—Dr. Edmund W. Wilson.

Registrar—Dr. Edwin H. Place.

Quartermasters—Dr. Martin J. English and Dr. William F. Doland.

Dentists—Dr. Ferdinand Brigham and Dr. Frank H. Cushman.

The Harvard Base Hospital Unit was rapidly mobilized in Boston during the early days of May, and left this city on May 7 for New York, whence they sailed later for Europe. The final personnel and military titles of the unit are as follows:

Majors—Robert U. Patterson, Medical Corps, U. S. Army, Commanding Officer; Harvey Cushing, Director; Richard P. Strong (absent in Europe) Chief Laboratory Section; Roger I. Lee, Chief Medical Section; Robert B. Osgood, Chief Surgical Section.,

Captains—Daniel F. Harmon, Medical Corps, U. S. Army Adjutant; Walter B. Cannon; Reginald Fitz; George S. Derby; Walter A. Boothby; Edward B. Towne; Charles Rund, Jr., Quartermaster, O. R. C., U. S. Army; Percy Browne, Horace Binney, Elliott Cutler, Henry Lyman.

Lieutenants—George P. Denny, Gilbert Horrax, Frank R. Ober, John J. Morton, Oswald H. Robertson, Thomas R. Goethals, Samuel C. Harvey, James L. Stoddard, Henry Forbes, A. V. Bock.

Dental Surgeons (Lieutenants)—William Potter, Harrison L. Parker.

There will be sixty-five nurses in the unit, of whom Miss Carrie M. Hall is head, and 147 men in the enlisted personnel, including orderlies, cooks, clerks, carpenters and electricians, besides ten sergeants from the United States Army.

POSTPONEMENT OF INDUSTRIAL HEALTH INSURANCE.

In a report recently filed in the Senate of the Massachusetts General Court, the Committee on Social Welfare recommended further study and investigation of the entire problem of industrial health insurance as advocated by Governor McCall in his latest inaugural address, and as embodied partly in the Young Bill now pending before the Legislature. With the report the Committee submitted a resolve providing for postponement of this legislation until after further consideration. The following quotations from the report indicate the attitude and advice of the committee on this important subject.

> "We must know to what extent private systems have reduced the amount of time lost by wage-earners.
>
> "What proportion of the wage-earners are at this time benefiting from existing insurance systems.
>
> "Whether they are showing a greater efficiency now than before these symptoms were established.
>
> "Whether there is agreement between employers

and employees as to the workableness of health insurance in this country.

"What the cost will be to the employer, employees and the Commonwealth for the maintenance of a comprehensive system of health insurance.

"What grounds the proponents of health insurance have for the claim that the movement has been successful in European countries.

"In view of the fact that Norway, Roumania, Russia, Serbia, Great Britain, the Netherlands, Germany, Austria, Luxemburg and Hungary have all adopted compulsory health insurance and that several State Legislatures have authorized a thorough study of the entire subject of social insurance, the opponents of such insurance must produce stronger evidence than any yet offered, to show why Massachusetts may not in the near future seriously consider some form of health insurance, together with maternity benefits and unemployment insurance.

"Much has been said at the hearings which may well lead us to give careful consideration to the words of Governor McCall in his inaugural message.

"If protection against the overtaxing of those engaged in industry can best be secured by the adoption of some system of health insurance, then that is what all of us, as good citizens, should work for.

"If, on the other hand, it is impossible to substantiate claims of those who testified to the success of health insurance in State and country-wide movements, then the Commonwealth may well hesitate to embark on the venture."

Presumably, this attitude of the Committee, combined with the opposition which has developed from various quarters to the progress of industrial health insurance, will mean, at least, postponement of all legislative action on this important question for the present, especially in view of the disturbance and engrossment of public interest by the entrance of the United States into the war. After the war, or perhaps next year, it may be expected that the entire subject will again be raised. Meanwhile, so far as the exigencies of the time permit, thoughtful investigation of industrial health insurance and its many problems should be conducted by physicians and medical societies, individually and collectively.

◆

THE GODDARD HOSPITAL.—The Goddard Hospital of Brockton, established in 1902, has recently issued a report of its work up to the present time. Organized to care for only maternity and surgical cases, it reports that it has admitted during the past year 312 surgical cases and 158 obstetrical cases. The total mortality for the year was 0.8%. Since 1906 there have been but eight maternal deaths, giving a total mortality of 0.5. There have been 29 Cesarean operations performed, with two maternal deaths and no fetal deaths.

MEDICAL NOTES.

ELECTRIC DELINEATION OF VISCERA.—In the issue of the JOURNAL for November 23, 1916 (Vol. clxxv, p. 766) we commented editorially on a method then recently devised by Dr. James Shearer at a casualty clearing station in France, for the electric delineation of the internal organs of the body. At that time we said, with reference to this method, "If experience bears out early expectations, this discovery should open a new field of diagnosis, which may prove applicable in many diverse conditions, not only surgical, but medical." In the issue of the *British Medical Journal* for March 24, 1917, is an item stating that "this expectation has not been fulfilled, and we have reason to believe that the inventor has failed to satisfy the physicists consulted as to the truth of his claims."

TUBERCULOSIS SOCIETY MEETING.—The thirteenth annual meeting of the National Association for the Study and Prevention of Tuberculosis is being held in Cincinnati, Ohio, May 9 to 11. The general meeting with address of the president, Edward R. Baldwin, M.D., opened at 4.30 p.m., on Wednesday, May 9. On Thursday and Friday mornings the meetings of the clinical, sociological and pathological sections were held. Many interesting papers were read. In this conjunction attention may be directed to the thirteenth annual report of the Boston Association for the Relief and Control of Tuberculosis, which, in addition to the record of the activities of the Association for the year ended October 31, 1916, contains the addresses by Dr. Edward R. Baldwin, Dr. Homer Folks and Dr. Lee K. Fraenkel at the thirteenth annual meeting of the Boston Association on Novemver 10, 1916.

A RARE ANATOMIC ANOMALY.—In the issue of the *British Medical Journal* for March 17, 1917, is described a rare anatomic anomaly recently observed by Professor Edward Fawcett in the dissecting room of the University of Bristol Medical School. This anomaly consisted in a double radial artery, associated with high bifurcation of the brachial which, in Dr. Fawcett's experience, is frequently associated also with an increased number of heads of origin in the biceps muscle. In this instance there were three heads.

"The vas aberrans left the brachial artery at the lower border of the tendon of the teres major muscle, ran downwards superficial to the median nerve, and at about the middle of the upper arm crossed the superficial surface of the biceps to reach its outer side at the end of the elbow. Below this point it bifurcated into two branches of equal calibre, one, more medial, which ran the course usually associated with the radial artery, the other, more lateral, which, running by the side of the radial vein superficial and lateral to the brachio-radialis muscle at the junction of the middle and lower thirds of the forearm, was joined company by the radial nerve, and with it reached the back of the wrist. The branch first described turned backwards under the tendons of the extensor ossis metacarpi pollicis and extensor brevis pollicis, having previously given off the anterior radial carpal and superficial volar branches; later it terminated under the extensor tendons at the back of the wrist as the posterior carpal artery, previous to which having given off the dorsal arteries of the thumb. The branch secondly described, having reached the wrist superficially, at once made for the proximal end of the first interosseous space, through which it passed to form the deep palmar arch, previous to which it gave off the dorsal artery of the index finger. From their behavior and their equality in size, one is justified in regarding each of these branches as a radial artery, hence the superscription—double radial artery.

"The condition is naturally one of some interest to clinicians. Professor Fawcett states that he has not once met with it in a period of 30 years' dissecting-room experience, although he has been asked if such condition might exist by more than one clinician."

A New Publication.—We have recently received the first issue of a new publication, the *Revue de Chimiothérapie*, issued at Paris, under the editorship of Dr. J. Laumonier. The science of chemiotherapy, which was in reality founded by Dujardin-Beaumetz and Bardet about twenty years ago, has hitherto been largely monopolized by German writers. The *Revue de Chimiothérapie* aims now to become its special organ and to restore the knowledge of the science to the country of its origin.

WAR NOTES.

Preparedness Work Among the Roentgenologists.—At the request of the Council of National Defense a Committee of Preparedness was appointed by the President of the American Roentgen Ray Society. This committee consists of the following members: Lewis Gregory Cole, George W. Holmes, Leopold Jaches, Willis F. Manges, and Harvey W. Van Allen, with an auxiliary Advisory Committee on which the following men have been asked to serve:—Frederick H. Baetjer, David R. Bowen, Eugene W. Caldwell, James T. Case, William D. Coolidge, Arthur C. Christie, H. W. Dachtler, Kennon Dunham, Arial W. George, Alfred L. Gray, Roland Hammond, Preston M. Hickey, Walter C. Hill, P. W. Huntington, George C. Johnston, Frederick Manwaring Law, Henry K. Pancoast, George E. Pfahler, John S. Shearer, Edward H. Skinner, Albert Soiland, W. H. Stewart.

The work planned by this committee has three divisions:

1. The canvass of the country for a complete list of medical men available for military roentgenology.
2. The establishment of schools in different geographical centers where uniform instruction in military roentgenology may be obtained.
3. Preparation of a manual on military roentgenography.

A circular letter has been sent to many roentgenologists, but the Committee greatly desires to reach all men engaged in the work. This specialty is one of the most important branches of military surgery and the workers are comparatively few. Therefore we most earnestly urge that all roentgenologists who possibly can will do their "bit" and volunteer their services to the country.

In order to have this service of the greatest efficiency, it is hoped that all roentgenologists will adopt the uniform technic which will be worked out by representative roentgenologists throughout the country. This technic will be described in the manual and taught in the schools.

Men willing to volunteer will kindly communicate with the Committee of Preparedness of the American Roentgen Ray Society with headquarters at Cornell University Medical College, First Avenue and Twenty-eighth street, New York City.

Boston Red Cross Hospital Called for Foreign Service.—The arrangements for the establishment of the Red Cross base hospital on the Common were suddenly interrupted by the call of the adjutant-general for its six base hospitals to go to France. It is expected that the units will leave within three weeks.

Each unit consists of 23 doctors, 2 dentists, 65 nurses and 150 enlisted men of the medical department, and is prepared to care for 500 wounded men.

Boston Chapter of Red Cross.—The Boston-Metropolitan Chapter of American Red Cross has moved its headquarters from Newbury Street to 12 Arlington Street, Boston. Formal dedication of the new headquarters was conducted on April 23. The American flag and Red Cross banner were raised, and Governor McCall and Mayor Curley spoke. The educational department is still to be conducted at the Lyman residence, at 138 Beacon Street.

Boston University Extra Session.—The Medical School of Boston University will continue its courses throughout the summer. This will enable the senior class to be graduated three months earlier next year, in order that they may be ready for government service if desired.

Preparedness of the State Board of Health.—In order that the State Department of Health and all local boards of health may be thoroughly proficient to meet all unusual demands upon them made by existing war conditions, a meeting was held of the chairmen of committees on hygiene, medicine and sanitation in the various towns and cities in conference with Dr. Allan J. McLaughlin. At this meeting were discussed the providing of hospital facilities, supervision over milk and water supplies, precautions against measles spreading among the soldiers, nursing for the soldiers in case of casualties, and particular hygienic measures in towns containing or contiguous to camp grounds.

Of typhoid fever there is little danger, since the soldiers are immunized by inoculation, but measles is found to be a serious menace to the troops. Extra precautions are deemed necessary, even where there are no local companies, as soldiers will come from every locality and will revisit their homes, and if they are not well protected against infection at home they may carry it back to the troops.

MEDICAL SUPPLIES NEEDED.—Surgeons at the Commonwealth Pier, where between 3000 and 4000 Naval Reserves are quartered, have practically no medical supplies, excepting those furnished by the Minute Man Committee of the Sons of the American Revolution. There is immediate need for many articles, and the committee is informed that the Government cannot supply them for several weeks. Any articles sent to Chairman Arthur May Knapp at the headquarters of the committee, 216 Washington Street, will be delivered immediately. The list of things needed includes:

Carbolic acid, aspirin tablets, boric acid, aromatic spirits of ammonia, nitric acid, ether, bismuth, collodion, glycerin, tincture of iodine, Dobell's solution, bottles, vaseline, talc powder, sutures and needles, compound cathartic pills, bandages (one, two and three inch), splint wood, rubber tubing, gauze, boric acid ointment, novocain, ice bag, hot-water bottle, rubber gloves, stomach pump, coryza tablets, menthol tablets.

PHYSICIANS NEEDED IN MEDICAL CORPS.—In an address before the Massachusetts Association of Boards of Health, Colonel Chamberlain, Medical Corps, U. S. A., stated that physicians are much needed in the Medical Corps and in the Medical Reserve Corps. There are two hundred vacancies, and there will be two hundred more unless the President takes measures to retain in service those officers whose terms of service will expire shortly.

TUBERCULOSIS AMONG FRENCH SOLDIERS.—It is reported that Dr. Herman M. Biggs, State Commissioner of Health, New York, recently returned from France, has estimated that from 150,000 to 160,000 French soldiers are at present suffering from active tuberculosis. At the end of the first year of the war 86,000 French soldiers suffering from the disease were returned to their homes. Of the deported population of France, approximately 1000 are being returned daily from Germany. Of the 20,000 returned in 1915, 5000 were tubercular. Some French authorities state that from 20 to 50% of the French prisoners of war in Germany are tubercular.

TUFTS DENTAL CLINIC FOR SOLDIERS.—The Tufts College Dental Unit, composed of eight men who have volunteered their services to all soldiers and sailors in need of dental work, have already attended to several hundred soldiers. The work is done at the Tufts Dental School and at the Boston Dispensary.

RUSSIAN RED CROSS.—At a lecture provided by Columbia University on "The Work of the Russian Red Cross in the Trenches," an address was read which had been written by Colonel Andrew Kolpashnikoff of the Twenty-first Siberian Flying Column of the Russian Army.

"At the outbreak of the war the Russian Red Cross was no more ready than the rest of Russia. There were fewer than 75 hospitals in a fighting line of 4,000,000 men. But much has been done since, and now 35,000 nurses are at work.

"The Flying Column, peculiar to the Russian Army, cares for the wounded during and after battle. When not serving it stays with its regiment in the trenches, its commander sleeping there, but it goes forth whenever heroes fall, and often passes the night in searching in the fields and woods for the wounded. Its pride is never to have a wounded man, and the percentage of men killed in the Flying Column is, therefore, great. Each commander has three doctors and about 300 men to help him in his difficult work. Distances on the Russian front are enormous, and first-aid stations are often 30 miles from a hospital. Owing to the scarcity of ambulances, springless carts often must be used to transport the wounded, but recent gifts of ambulances have been made to the Russian Red Cross by Americans."

AMERICAN FUND FOR FRENCH WOUNDED.—The New England Branch of the American Fund for French Wounded, from March 15 to April 10, shipped the following-named hospital supplies: 197,817 surgical dressings, 22,309 yards surgical gauze, 1301 pounds absorbent cotton, 980 yards adhesive plaster, 250 hot-water bottles and air cushions, 217 yards rubber sheeting, 229 hypodermic syringes and needles, 960 blankets and sheets, 5182 pillows (fracture, bed and comfort), 1267 pillow slips, 6060 pairs socks, 1845 additional knitted articles, 5484 flannel garments, 10,622 towels, handkerchiefs, washcloths, 1115 pairs slippers, 332 comfort bags (filled), 2104 yards flannel, 1104 pounds condensed milk, 4116 miscellaneous articles.

New Hampshire Base Hospital.—Bishop Guertin of the Catholic Diocese of New Hampshire has offered to the government the use of the recently vacated Old Ladies' Home in Manchester, N. H., for use as a base hospital. The War Department has asked that the offer be kept open for one month. It is understood that the services of the Sacred Heart Hospital staff and Sisters of Mercy go with the offer of the building.

Coöperation of Massachusetts Boards of Health.—On April 26, the Massachusetts Association of Boards of Health will hold its quarterly meeting and will discuss the relation of the State and local boards of health to general preparedness. The discussion will be opened by Dr. Allan J. McLaughlin, and those taking part will be Dr. Harold C. Ernst, professor of bacteriology of the Harvard Medical School; Dr. Thomas F. Harrington, of the State Board of Labor and Industries; and Colonel W. P. Chamberlain, U. S. A.

Care of Mental Disease in the Army.—A committee has been chosen to devise ways and means of maintaining a hospital to care for mental disease among soldiers. This is stimulated by the recommendations of the National Committee for Mental Hygiene. The Governor, acting with this committee, sent recently the following telegram to Major-General W. C. Gorgas, surgeon-general of the United States:

"Massachusetts offers personnel and equipment for hospital unit to care for soldiers suffering from nervous and mental diseases, said unit to be attached to any base hospital located in Massachusetts. This is in accordance with plans submitted to you by the National Committee for Mental Hygiene."

Dr. L. Vernon Briggs is secretary, and other members of the committee include Dr. George M. Kline, chairman, also chairman of the Massachusetts Commission on Mental Diseases; Dr. John A. Houston, superintendent of the Northampton State Hospital, treasurer; Dr. Walter E. Fernald, superintendent of the Massachusetts School for the Feeble-Minded; Dr. E. H. Cohoon, late administrator of the Psychopathic Department of the Boston State Hospital, and now superintendent of the Medfield State Hospital.

The need of such a hospital is explained in the following report of the National Committee for Mental Hygiene:

"The extensive prevalence of mental disorders in military life, as compared with civil life, is borne out by statistics drawn from various sources. Mental diseases were approximately three times as prevalent among the troops on the Mexican border last summer as among the adult civil population of the state of New York. The excess among soldiers is still higher under war conditions. In our own army the insanity rate rose during the Spanish-American war from 8 per thousand to 20 per thousand; in the German troops during the Boxer rebellion the rate reached 50 per thousand. The statistics available regarding the incidence of mental diseases in our own troops indicate that an army of 500,000 may be counted upon to have 1500 insane patients a year in peace, and not fewer than 4500 a year in war, or even perhaps at times of rapid mobilization. In other words, the number of insane patients coming to notice from such an army under the conditions which prevailed on the Mexican border last summer is certain to exceed the entire number of men admitted annually to all public institutions for the insane in the state of California."

The Massachusetts committee, besides voting to authorize the Governor to offer to the War Department the personnel and equipment of a hospital unit, voted to establish a unit on the grounds of one of the state hospitals and to consider establishment of others. It further voted to recommend that Massachusetts send for nervous and mentally sick soldiers belonging to the state, where adequate provision for transportation cannot be obtained. The state at present will be at no expense in establishing the hospital units, as citizens have subscribed already more than $5000.

Columbia's War Hospital.—Mention has already been made in the Journal of the proposed war hospital of five hundred beds, to be erected by Columbia University. The cost of erecting the hospital and maintaining it for one year, with a capacity of 500 beds, has been estimated at $700,000, and the committee in charge of collecting funds will make the raising of this amount by popular subscription its immediate object. A simple announcement of the proposal to build the hospital, before any organization or appeal had been prepared, resulted in spontaneous public subscriptions totaling more than $50,000. The Hospital will be erected on the old Columbia Oval in the Bronx. It will be used, not only for the care of soldiers and sailors, but for any emergency which may arise, such as disaster from explosions, fires and other accidents. Aside from this service, the Hospital will be the center of practical training for surgeons, nurses and others intending to do Red Cross work at the front. The present lack of facilities to train men in the peculiar demands of war service, will be met in this institution, for it is designed to organize the hospital exactly like a Red Cross base hospital unit. If, as is suggested, the Government should take over the French ambulance service, now maintained by individual Americans, this preliminary training would be of appreciable value. The finance committee consists of William H. Woodin, president of the American Car and Foundry Company, as treasurer, and Dr. William H. Bishop; Frederick A. Goetze, treasurer of Columbia University; Willard V. King, president of the Columbia Trust Company; Dr. Adrian V. S. Lambert, associate professor of surgery of the College of Physicians and Surgeons; Dr. Samuel W. Lambert, dean of the college; Dr. J. Bentley Squier, professor of urology in the college; and Dr. Francis Carter Wood, director of the Crocker Research Fund.

FURTHER CALL FOR BRITISH PHYSICIANS.—The War Cabinet declared on April 20 that every physician and surgeon and every man with medical training of military age must be called up for service immediately. The official explanation is as follows:

"The enemy, in total disregard of the accepted tenets of civilized warfare, has deliberately instituted a submarine campaign against hospital ships, and it has, therefore, become essential that a large number of hospitals should be established overseas in the various theatres of war for the treatment of sick and wounded. In order to allow this to be done with great rapidity, it is essential to secure the services of every doctor that can possibly be spared from the United Kingdom."

COMMITTEE TO FINANCE RED CROSS.—At the first meeting in Washington of the committee called by the President to devise means of financing the American Red Cross, Cleveland H. Dodge of New York was elected chairman of a committee to conduct a campaign to raise funds. F. L. Higginson, Jr., of Boston was elected one of the vice-chairmen of this committee. The campaign will probably end with a special Red Cross day some time in May, to be designated by presidential proclamation.

It was pointed out at the conference that the finance committee will probably operate in two ways, nationally and through the local Red Cross chapters, of which there are now 460 throughout the country. The work of the society will be limited to the funds collected. If this amount is large enough, the work will be extended to a general relief service for the Allies along their various fronts in addition to taking care of the hospital and home relief needs in this country.

BOSTON COMMITTEE ON PUBLIC SAFETY.—To fill the position of chairman of the sub-committee on hygiene, medicine and sanitation of the Boston Committee on Public Safety, left vacant by the call of Dr. Richard P. Strong to Washington, Dean Edward H. Bradtord of the Harvard Medical School has been chosen.

WAR TIME MEDICAL ARRANGEMENTS.—The general medical board of the Council of National Defense met in Washington on April 22 and discussed plans for giving the country an efficient war time medical service, not only in the military and naval establishments, but in civil life as well. Members of this board include: Surg.-Gen. Gorgas of the Army, Surg.-Gen. Braisted of the Navy, Surg.-Gen. Blue of the Public Health Service, Col. Jefferson R. Keene of the Red Cross, Dr. William H. Welch of Johns Hopkins, Drs. William and Charles Mayo of Rochester, Minn., Dr. Richard P. Strong of Harvard, Dr. Charles Peck of the University of New York, and Dr. F. F. Simpson, chief of the Defense Council's medical section.

Recommendations of the medical board, that medical schools of the country do not graduate their students prematurely as an emergency measure, and its suggestions for continued observance of the army's regulations requiring that medical recruits have a year's hospital experience, are strongly indorsed in the following statement given out by Dr. John M. Baldy of Philadelphia.

"The country needs medical men for the new army, but it needs medical men of proper education. We had a recent experience in the Spanish war of the disastrous results of an incompetently conducted medical service. Every care should be taken that such an experience be not repeated, that the war policy of the Council of National Defense be supported, and that the service of our home hospitals be not ruined, and that our civilian populations remaining in the shops and fields be not neglected.

"With the political pacifists relegated to their proper places of innocuous desuetude, and with selective conscription in force by drawing on the medical graduates of recent years, and without injuring our future supply, there will be no lack of competently educated medical men in the army and navy."

Dr. Baldy recommended that schools that have speeded up graduation rescind their action, pointing out that graduates, in the normal course of events, will be needed within a few months to take the places of internes drawn from hospitals to do military service.

WAR RELIEF FUNDS.—On May 12, the totals of the principal New England war relief funds reached the following amounts:

Belgian Fund	$602,804.74
French Wounded Fund	226,180.25
Armenian Fund	182,084.09
Serbian Distress Fund	117,744.66
Permanent Blind Fund	111,294.35
French Orphanage Fund	100,985.13
Serbian Hospitals Fund	90,607.31
Surgical Dressings Fund	84,877.47
Boston Ambulance Fund	82,983.48
Italian Fund	40,198.27
Lafayette Fund	26,976.03
Louvain Fund	10,017.03
Siberian Ambulance Fund	6,839.11

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending Saturday, May 12, the number of deaths reported was 278, against 303 last year, with a rate of 18.77, against 20.78 last year. There were 39 deaths under one year of age, against 42 last year, and 82 over 60 years of age, against 94 last year.

The number of cases of principal reportable diseases were: diphtheria, 99; scarlet fever, 38; measles, 230; whooping cough, 10; typhoid fever, 2; tuberculosis, 49.

Included in the above were the following cases of non-residents: diphtheria, 12; scarlet fever, 4; measles, 1; tuberculosis, 7.

Total deaths from these diseases were: diphtheria, 5; scarlet fever, 3; measles, 5; whooping cough, 1; tuberculosis, 23.

Included in the above were the following deaths of non-residents: diphtheria, 2; scarlet fever, 1; measles, 1; tuberculosis, 3.

Prevention of Infantile Paralysis.—In an effort to prevent another epidemic of infantile paralysis in Massachusetts this summer, the State Health Department is about to start a campaign of preventive measures. A booklet on the disease has been prepared by Dr. Lyman A. Jones, and will be for the information of parents throughout the State. Cleanliness is urged as a primary consideration. Over-feeding is to be guarded against, and over-dressing of infants. The pamphlet points out that most of the cases occur between May and September, and this is, therefore, the time for strictest caution.

Boston Floating Hospital.—The Boston Floating Hospital wishes to call to the attention of the public and the profession that it will not discontinue its work this summer because of war conditions. The boat is now being put in readiness, and its staff of doctors and nurses selected. An appeal for funds to carry on the summer's work is made, as usual.

Infantile Paralysis in Maynard.—A mysterious case of illness which had caused some apprehension in the town of Maynard, was discovered to be infantile paralysis, and has been so reported to the local and state boards of health. The case was included in the reported number of 34 cases since January 1, which is about the normal number for this time of year.

Hospital and Health Center for Franklin.—Through the gift of Mr. and Mrs. Harry T. Hayward, an old colonial property in Franklin, Mass., has been purchased and presented to the Nursing Association for hospital purposes. The house is a solidly constructed building, heavily timbered and rests on strong foundations. The donors will remodel the interior for hospital uses. It is planned to include in the building nurses' quarters, an operating room for emergency cases, and minor operations, and quarters for eye, ear, nose and throat, dental and tuberculosis clinics. The Franklin Nursing Association, organized fourteen months ago, will thus be provided with a home for its district nurses and a center for public health activities of all sorts. No long cases will be taken here, but the hospital will be a clearing house for the larger institutions, and should greatly increase the usefulness of the Association.

Fund for Waltham Hospital.—An effort is being made by the Waltham Hospital to raise a fund of $40,000 to enlarge and re-equip the Hospital to meet existing conditions. The surgical department is inadequate, and there is immediate need of a new wing to house the department and new equipment to furnish it. No money can be spared from the hospital's current income as the expenses have exceeded the receipts by more than $3000 in each of the past two years. Checks payable to the Waltham Hospital may be sent to Miss Susan W. Beal, Hospital Building, Waltham.

The Massachusetts Medical Society.

NOTES FROM THE DISTRICT MEDICAL SOCIETIES.

Hampshire District Medical Society.—The annual meeting was held at Boyden's Restaurant, Northampton, on May 10. The retiring president, Dr. C. J. Byrne of Hatfield, read a paper on "Alcohol." A nominating committee, consisting of Dr. W. P. Stutson, Dr. C. R. Gardner and Dr. J. M. Fay, retired and brought in the following list of officers for the coming year, and they were elected: president, Dr. A. G. Minshall; vice-president, Dr. H. G. Rockwell; secretary, Dr. J. D. Collins; treasurer, Dr. J. G. Hanson; librarian, Dr. F. E. Dow; commissioner of trials, Dr. W. P. Stutson; councillors, Drs. C. J. Byrne, O. W. Cobb, J. S. Hitchcock, F. H. Smith; councillors for nominating committee, Dr. J. S. Hitchcock; alternate, Dr. F. H. Smith; censors, C. J. Byrne, C. T. Cobb, A. J. Bonneville, J. E. Hayes. Dr. Minshall in assuming the chair made a neat speech of acceptance.

The following Fellows have been accepted for service in the Medical Reserve Corps of the Army; Drs. J. D. Collins, W. J. Collins, H. B. Perry, E. H. Hughes, Northampton, and J. F. Bowen, Amherst. Drs. E. C. Greene and E. E. Thomas have forwarded applications for the above, to Washington.

E. E. Thomas, M.D., *Correspondent.*

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY.

Albert Clarence Lane, a member of the Middlesex East District Medical Society, was born in Chichester, N. H., and fitted himself for the study of medicine at Pittsfield Academy, N. H. He received his medical training at Dartmouth and Long Island College Hospital, from which he was graduated in 1879, and at once entered into active practice in Billerica, Mass., giving all his thought and energy to his work. His skill and vigilance attracted attention, and his patients felt to an unusual degree they could safely confide in him.

For a short time he resided in West Medford, Mass., but in 1900 moved to Woburn, where he sustained his enviable reputation as a general practitioner.

He was one of the original members of the Charles Choate Memorial Hospital Association and served upon the Hospital Staff. He was a thirty-third degree Mason and a Past Master of Thomas Talbot Lodge, A. F. and A. M.

Dr. Lane died February 1, 1917, aged 65 years. He is survived by his wife, a son, C. Guy Lane, M.D., and one daughter.

A. E. SMALL, M.D., *Secretary.*

◆

SOCIETY NOTICES.

AMERICAN MEDICAL EDITORS' ASSOCIATION.—The annual meeting of the American Medical Editors' Association will be held at the McAlpin Hotel, New York City, on June 4 and 5, under the presidency of Dr. G. M. Piersol, Editor of the *American Journal of Medical Sciences*.

A most interesting and instructive program is now being prepared and it is contemplated that the forthcoming session will be the largest ever held in the history of the Association.

The forty-eighth anniversary of this society will be celebrated by a banquet, on the evening of June 5, at the McAlpin Hotel.

WOMEN'S MEDICAL ASSOCIATION.—The Women's Medical Association of New York City is planning a banquet, to be held at the Hotel McAlpin on Wednesday evening, June 6, 1917, for the women physicians who will be in New York City for the meetings of the American Medical Association. Tickets, three dollars, may be obtained from Dr. Mathilda K. Wallin, 616 Madison Avenue, New York City.

◆

RECENT DEATHS.

WILLIAM HENRY WINSLOW, M.D., an eye specialist and a Civil War veteran, died at his home in Roxbury, on April 8, of pneumonia. Dr. Winslow was born in Belfast, Me., in 1840. He was graduated from Annapolis and served for a short time in the navy. Later he studied medicine and was graduated from the University of Pennsylvania, Jefferson Medical College and Hahnemann Medical College. He practised for many years in Philadelphia, Pittsburgh and Boston, becoming a specialist in diseases of the eye. He was, for many years, editor of the *Hahnemannian Monthly* of Philadelphia, and was the author of many articles as well as of the book, "The Human Ear and Its Diseases." Besides contributing articles on sports to magazines and newspapers, he wrote a number of historical novels concerning the Civil War, including "Cruising and Blockading," and "Naval Lads and Lassies." Dr. Winslow was a member of the military order of the Loyal Legion, and of the Masons. He is survived by his widow and two sons.

WINFRED NEWELL EMERY, M. D., who died on April 5, at his home in Waltham, was born at South Chatham, Mass., June 11, 1866. Dr. Emery was educated in the Boston public grammar and high schools, the Berkeley Institute and Boston University School of Medicine, graduating from the latter institution in 1891. His death after an illness of two months was due to hardening of the arteries. He is survived by his wife and three children.

WALDO HODGES STONE, M. D., died at his home in North Rehoboth at the age of 62. He was graduated from Boston University School of Medicine in 1882. He practised his profession in Providence, R. I. He is survived by his wife.

DANIEL O. KING, M. D., died recently at his home in Providence, R. I. He was graduated in 1875 from Bowdoin Medical School. Dr. King administered the Pasteur treatment to the first patient in the city of Providence.

EDWARD T. TUCKER, M. D., died on April 10 in New Bedford, where he had practised medicine for 40 years. He was a graduate of Brown University and the Harvard Medical School.

WILLIAM APPLETON BELL, M.D., a leading surgeon of Somerville, dropped dead of heart disease, in his garage, April 3, 1917. He was a son of Luther V. Bell, for twenty years superintendent of the McLean Hospital, and was born in Somerville, May 16, 1851. He received his education at Phillips Exeter Academy and Harvard College, where he was graduated in 1873. Three years later he took his M.D. from Harvard Medical School and went abroad to study medicine for a period of three years, but not until he had married Ida Mills, of Lawrence, and had joined the Massachusetts Medical Society. On his return he practised in Somerville, became visiting surgeon to the Somerville Hospital on its organization in 1891 and filling a regular service ever since. He is survived by two sons, one of them being Research Fellow in Biological Chemistry in Harvard Medical School.

MOSES J. WHITE, M.D., who died recently in Milwaukee, Wis., was born in Hartford, Conn., Feb. 28, 1860. He descended from a line of physicians. He was a student at Princeton University and Lafayette College and was graduated from the medical department of the University of New York in 1884. He was appointed assistant physician at the Manhattan Hospital for the Insane, and later accepted a similar position in the Milwaukee Hospital for the Insane. At the end of his first year in the latter hospital he was appointed superintendent, a position which he held for 28 years. He was professor on mental diseases in the Wisconsin College of Physicians and Surgeons and in Marquette University. For several years he was a lecturer in colleges. He was a member of the American Medical Association, the American Medico-Psychological Association, the New York Medico-Legal Society, the Wisconsin State Medical Society, and the Milwaukee Medical Society. He is survived by his widow and a son, Dr. Reginald James White of Hartford, Conn.

GEORGE BAKER UNDERWOOD, M.D., a Fellow of the Massachusetts Medical Society, died at his home in Gardner, February 2, aged 62 years. He was a graduate of the Dartmouth Medical School in 1882, and joined the Society, from West Gardner, in 1884.

WILLIAM W. BURNETT, M.D., of Wrentham, Mass., died on February 18 of heart disease while returning from a night call in an adjoining town. Dr. Burnett was born in New York City, Nov. 9, 1848. He graduated from the New York Homeopathic Medical College in 1870, practised medicine in that city, in Freehold, N. Y., in Washington, D. C., and in Amherst, Mass. He had been located in Wrentham for about twenty years. He was a member of the Washington Medical Society and the American Institute of Homeopathy. A widow and two children survive him.